The Builder.

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Sanitary Blue-Books from Melbourne.

THE sanitary condition of Melbourne has been the subject of an elaborate inquiry by a Royal Commission appointed two years ago, and which appears since to have been prosecuting its inquiries with most commendable zeal and thoroughness. The result of its procedure is now before us in the shape of four reports and a formidable mass of evidence. Three "Progress Reports" were issued, and a final report has now followed, which, we presume, closes the labours of the Commission. The evidence taken includes a good deal in regard to the capitals of others of the Australian colonies, Sydney and Adelaide, as well as in regard to lesser towns, into the state of which inquiry was made, especially as to the success or non-success of various sanitary schemes, in order to throw light on the general question of what could or ought to be done in Melbourne. The evidence thus taken gives an interesting view of the state of sanitary matters, and of the special difficulties to be contended with in this comparatively new country.

The present population of Melbourne City is only 76,000, with a density of 23 per acre, though the city proper is surrounded by various suburban municipalities, some of them more thickly populated, but with an average density over the whole area of only 6·3 per acre, and numbering altogether over 420,000 inhabitants; but we gather that the inquiry concerns all these suburban districts also, that any public works undertaken would be for the benefit of the whole of the collective districts as well as of the city, and that hence some of the difficulties attending sanitary action and improvement are such as arise from the extent of the area to be dealt with and the rather scattered nature of the population.

The heads of inquiry under which the First Progress Report is issued are those of "General Sanitary Condition of Melbourne," "Meat Supply," "Abattoirs," "Noxious Trades," and "Water Supply." The first and the last two headings include such considerations as would be common to large towns in any other part of the world, but the question of method of meat supply and the position and construction of abattoirs assumes a special importance in Melbourne and other Australian cities, in consequence of the immense and quite exceptional export trade in meat which is carried on from them.

The preamble of the First Report states that the Commission, besides examining into the sanitary state of Melbourne, had visited Adelaide and Sydney in order to inquire into the state of drainage and of the regulations in regard to noxious trades in those cities. The report then commences with a description of the existing sanitary condition of Melbourne, which is rather surprising reading, and quite contradicts the idea which many English people, we believe, entertain as to the spirit of progress abroad in the Australian cities. Sanitary matters in Melbourne, at all events, seem to be in a sadly inchoate condition. The pan or pail system for solid refuse is in full operation, with accompanying results which are detailed with painful minuteness in some of the evidence. All liquid refuse flows down open channels in the streets. This drainage goes into the river Yarra, a stream which, as we see from the map of Melbourne and suburbs appended to the report, winds through a considerable portion of the suburbs and through a part of the city. This river is further polluted by the direct drainage into it of waste liquids from noxious trades situated on its banks, such as abattoirs, wool-scouring establishments, and tanneries. The Yarra frows from the North-east portion of the suburbs, and meets what is called the salt-water river flowing from the North-western suburb, the two forming roughly the forks of a Y of which the stem runs southwards into the sea. The salt-water river is described as even more polluted by drainage from noxious trades on its banks. "Into it pass large quantities of blood-stained fluid from the city abattoirs, and blood from the slaughter-yards at Footscray and Braybrook, of the contents of intestines from gut factories, of waste liquids from bone mills, manure works and boiling-down establishments, and the washings of pelts and wool from fellmongeries." As these streams mostly "wash" (?) the region of the suburbs, it is not surprising to read further on in the report that the death-rate in the suburbs is higher than in the city itself. It appears that even the somewhat primitive method of drainage by open channels in the streets is in anything but a complete or satisfactory state in itself, as the following extract from the report sufficiently indicates:—

"In many of the suburbs a large proportion of the channels are still unmade; the liquid sewage from the houses passes sluggishly along natural channels in the ground, here and there accumulating and stagnating, and everywhere soaking into and polluting the soil. In sandy districts the liquid house-refuse is largely allowed to lose itself in the sand around the houses. The channels which have been made are not in all cases accurately levelled, with a sufficient fall, and not infrequently the flow is checked by solid refuse which collects in them. Under such circumstances, the sewage lingers in the channels, and undergoes decomposition. The permeable joints of the pitchers allow great contamination of the soil beneath. This evil is greatest where blocks of houses are intersected by branching lanes and passages, in which channels, having often only a slight fall, may be traced for long distances, uniting together and bending at various angles before they reach the main channel in the street. In some instances, these complicated channels in the blocks cannot reach the streets directly; a length of underground piping is necessary, which commences as a catch-pit, covered by a grating. During heavy rains, solid refuse of all kinds is swept down the channels and accumulates over the gratings, and the drainage then overflows the lanes and yards. Thus the soil is constantly being polluted in greater or less degree; and in the crowded portions of the metropolis, where the evil is greatest, the floors of the houses are often close to the ground, so that the mischief is intensified. In certain places crude forms of underground drainage have been introduced to remedy the ill conditions of groups or terraces of houses; but it is questionable whether the remedy so applied does not involve greater dangers to health than the open nuisance originally existing."

This is bad enough reading, but what follows is worse:—

"The underground sewers are not sufficiently ventilated, offensive gases escape through the various openings, and accumulations of a black and very offensive silt frequently occur, which is removed through manholes. During this process of removal the smell from the sewers is very offensive, and the air is necessarily polluted. The greatest pollution of the air, however, is produced by emanations from the pans for night-soil. The closets are frequently placed very close to dwelling-houses, and are not ventilated. No earth nor deodorant is used in the e pan-closets, except in a few cases; the pans are not cleansed in any way, and in many instances are not emptied with sufficient frequency. Hence, most intolerable odours arise during the process of emptying these receptacles into the night-carts. The moist residue left in every pan after emptying produces offensive effluvia, which persist till the residue has dried and crusted. *Less perceptible but constantly present are the emanations from the thousands of pans all through the metropolis.*"

This evidence on the effect of the pan

system in Melbourne ought to be of interest to those English local authorities who still partially retain and even defend it for special districts.

Adelaide and Sydney, it would appear, have both taken the lead of Melbourne in regard to drainage, though the movement has only been very recent in Adelaide, which was described by one witness as having been, prior to the commencement of its new drainage system in 1885, "a city of stinks." Now all this is altered. "The city is now free from offensive ordours, the subsoil is recovering, the street channels are used only for surface water, and the Torrens has been changed from a filthy sewer to a beautiful lake." The sewage is carried out of the city by gravitation to a sewage farm four and a half miles from the centre of the city (rather close quarters); the following particulars as to the working of the farm may be of interest in this country:—

"The farm is 480 acres in extent, and receives in round numbers the sewage of 70,000 inhabitants. About one-third of the soil is of a gravelly, porous character; the remainder is loamy, with a thin layer of clay underneath. The farm is worked on the broad irrigation principle, combined in the winter months with intermittent downward filtration. Before passing on to the land the sewage is strained—the solid matter is collected and trenched in, and the liquid portion is distributed over the farm by wooden troughs.

The cost of the system, up to June 30, 1888, was 324,500*l.*, and the sewage rate on the citizens is 8d. in the £. The cost of converting the old closets to water-closets was about 10*l.* per closet. Concerning the financial working of the farm, it may be briefly stated that the balance-sheet, at the end of June, 1886, showed a profit on the working expenses during the previous six months of 720*l.* In the following six months there was a profit of 200*l.* But when the balance-sheet for the year ending June 30, 1887, was prepared, there was a loss of 740*l.*, the profit made in the first six months of that financial year being swept away. The loss was due to the excessive wetness of the season, the farm being unable to absorb all the sewage. The operations for the year ending June 30, 1888, resulted in a profit of 391*l.*"

At Sydney underground sewers were laid down as early as 1854, which, however, discharged directly into the harbour. In 1880 a complete deep-drainage system was carried out, with an intercepting sewer to the northern portion of the system, which carried away the sewage to the ocean at Bondi, where there is a strong current which carries it away. The southern portion of the city drains into a shallow estuary, and the sewage is conducted by a main sewer to a sewage-farm at Botany, where there are a thousand acres of sandy soil suitable for filtration purposes. So runs the description in the report, though we do not quite see, if this part of the sewage is taken on to land in the end, what is the use of the episode of the "estuary." It is stated, however, that the Sydney drainage works, which are still in progress, have proved eminently satisfactory in their results so far. We do not gather anywhere from the evidence what is the distance of the sea outfall of the Bondi sewer from the town, but we observe in the minutes of evidence that the commissioners very properly questioned their expert witness closely in regard to the construction of the sea outfall and in regard to the evidence as to the behaviour of the sewage after delivery into the sea. This witness was Mr. W. C. Bennett, Commissioner and Engineer-in-Chief of Roads for the Government of New South Wales, who in his evidence expressed himself strongly in favour of running sewage away into the sea where possible to do this at reasonable cost. "There is no money," he said, "to be made of it, however elaborate all the statements in England may be." On the south side of Sydney, Mr. Bennett said, there was no opportunity of doing this; "the sewage drained into a large shallow estuary, and we thought it better there to provide the sewage farm." This is the estuary referred to in the Report, apparently, though the evidence still does not explain the relation of the sewage farm to the estuary. In regard to sea outfall, the witness stated that there was an iron shield or ferrule used to protect the openings, and after this was rather vaguely described the following evidence was given as to the getting away of the sewage from the outfall:

"2,287. Opposite the outlet I noticed at our visit, there was discolouration of the water, and that the discoloured part bore away towards the south—is there any constant current in that direction?—The current outside is very constant to the south, but the long-shore current varies with the tides; there are eddies, but we have never had any complaint of anything being carried inland, because it is a very salient point of the coast.

2,288. No complaints from Coogee?—No.

2,289. Have you made experiments to see what course the sewage takes when it gets into the sea? We examined with corks before we bored it.

2,290. There is no eddying round in the Coogee?—No, it goes away well to seaward.

2,291. What became of the corks?—They floated away to seaward with the south current."

This seems satisfactory so far; and no doubt when you can get a sea outfall far enough off, and a sea current which will carry the sewage well away from the coast, there is much truth in Mr. Bennett's theory of the desirability of getting rid of it and seeing no more of it. But the sewage of London (to which one's mind naturally reverts) is of too exceptional proportions to be regarded in the same light as that of cities of ordinary or secondary size, nor have we such an advantageous place of outfall as appears to be available for Sydney: so we can only look on with a certain amount of envy at this comparatively easy solution of the problem.

To return to the main business of the report before us, the sanitary improvement of Melbourne, the Commissioners in their first report came to what appears the inevitable conclusion from the evidence, that no half measures in the way of attempting to better regulate the present system of refuse disposal would be of the slightest ultimate advantage:—

"No thorough reform would be secured by improved pan services for solid sewage, or by the use of destructors for general refuse, without such a system of drainage. The liquid sewage of the city, which constitutes the great bulk of the refuse to be disposed of, would still remain untreated; the street-channels, whether on the surface or beneath it, would still remain offensive; the subsoil would still be damp and foul; and the river would continue to be progressively polluted. Intercepting sewers would not diminish the offensiveness of the drains, nor sensibly improve the condition of the subsoil; and the pollution of the river would simply be replaced by pollution of the harbour. Being thus definitely of opinion that a system of underground drainage must be instituted, we propose to take such skilled evidence as may be available concerning the best method or methods to be adopted, but we are satisfied that the evidence which may be so obtained cannot be more than ancillary. . . .

We therefore recommend that, as soon as possible, a civil engineer of the highest attainments, and of practical experience in sanitary and hydraulic works, be selected to prepare such a scheme after thorough study of the local conditions, which are admittedly full of difficulties. The question at once arises by whom shall such an engineer be appointed, and from what fund shall he and his assistants be remunerated?

In our opinion such engineer should be appointed as soon as possible by the Government, and should be provided with such assistance as he may require; and the remuneration of such engineer and his assistants, also the expenses incidental to the formulation of the scheme, should be a first charge upon the funds at the disposal of a Metropolitan Board of Works, which Board should be created without delay, and should be charged with the control of the water supply and sewerage.

In the meantime, it is our intention to gather as much local information as possible from the best sources, to obtain sections and other geodetic measurements across country likely to be traversed by main lines of sewers beyond the metropolitan districts, also the levels and particulars of soils and subsoils of lands whereon might perhaps be ultimately selected sites for sewage farms and filtering beds. The information might be placed at the disposal of the engineer when appointed."

The Commissioners then go into the question of the constitution of the proposed Board of Works, adding a number of recommendations as to the special powers to be given to it; and following the example of Sydney, they recommend (and wisely) that the numbers of the Board should not be large, as the object is to work and not to talk. They then subjoin some "interim recommendations" for the sanitary benefit of Melbourne until such period as the proposed Board may be formed and the proposed drainage works carried out. The main suggestions in this part of the report are that all "tips" of rubbish should be abolished, that ordinary refuse should be burned in destructors, and that an effort should be made to render the administration of the pan-system at all events as innocuous as possible for the present:—

"That the ordinary system of pans for night-soil be abolished; that instead thereof, every closet be furnished with a double-pan service; that at least once a week, or so much more frequently as the local board of health may from time to time direct, the pan in use be closed with a tight-fitting lid, and removed in the day time in a suitable cart; that a pan cleansed by superheated steam, or some equally efficient means approved by the local board of health, be left in its place; that the use of a suitable deodorant be made compulsory; that the night-soil removed be either treated in a destructor or be trenched or ploughed into land; that failing the use of a destructor the contractor be compelled to obtain a receipt from the occupier of the land whereon deposit is made, or from the manager of some approved depôt for night-soil, for the number of pans there emptied or delivered; that stringent supervision be exercised by the boards of health over all such depôts or places of deposit."

They also add the very pertinent suggestion that the inspectors of nuisances in all districts "be as far as possible freed from all other duties;" and it would certainly seem that in a city in the present condition of Melbourne an inspector of nuisances who was disposed to do his duty would be likely to find his hands full.

Then follows the consideration of the important question of abattoirs, and of the whole system of meat supply, which, as observed, assumes such large proportions in the Australian cities. The result of the Commissioners' inquiries is that the suburban abattoirs should be immediately abolished, and they are not disposed to listen to any half-measures, but advocate a general adoption of the system of country abattoirs and chilled meat trains; the process of chilling being, it is to be gathered from the evidence, not deleterious to the meat in the same manner that freezing is held to be. This is a question beyond our province; but as to the main question of the health and comfort of the town there can be no doubt that the Commissioners are entirely in the right, and it seems indeed quite monstrous that immense establishments for the continual slaughter of cattle on a large scale, not for the provision of the town but for export, should be kept up within the precincts of the town. As to other inconveniences to the town from this state of things the evidence of Mr. Dickinson, a medical man residing in one of the suburban districts, is rather striking. The cattle, he says, are not allowed to be driven through the streets except after ten at night, but after that hour, on what is called "cattle night," the roads are unsafe for pedestrians; there is one street, Epsom-road, that is useless after ten on "cattle night," the inhabitants dare not go into Melbourne to the theatre for fear of encountering these half-wild cattle on their return, and the witness had himself, even when driving, had to go a long way round to avoid the cattle; to try to drive through them, he said, was unsafe. With all this, and the mass of evidence as to the nuisance from the abattoirs, it is not surprising that the Commissioners should have made a very decided stand as to the removal of the abattoirs from the precincts of the town, except with the allowance of one in the neighbourhood of the town under very stringent regulations. Yet in their final report, issued since the commencement of the present year, the Commissioners note that no improvement of importance has been made, and that things are still as unsatisfactory and insanitary as before. It does not appear, however, that Melbourne stands alone in respect of the bad administration of its abattoirs; the evidence of one witness who had made the subject a special study gave a most unfavourable impression as to the great Chicago pig-killing establishments, in which he said it was literally true that the pigs were driven in at one end and came out in the

shape of tinned meat at the other end; the arrangements for the production of this metamorphosis were, the witness testified, most ingenious and elaborate; but the approaches to the works were in so filthy a state that no one could walk up to the entrance, and the general impression produced by the whole place, in regard to cleanliness and sanitary condition, was summed up in the remark of one of his party—"I will never eat tinned meat again!"

The second Progress Report deals with the water supply of Melbourne, the oldest and principal portion of which is from the Yan Yean reservoir, a supply which dates from the year 1853, and consists of water impounded from a large catchment area. The great drawback to this supply seems to have been the existence of farms on the slopes draining towards it, a point several times touched upon in the report, with regard to various localities. The Commissioners take a very strong view of the matter; they recommend, for instance, that no dogs should be kept on catchment areas, a prohibition no doubt desirable, but which we should fear it would be exceedingly difficult to carry out. The strong representations made in the Progress Report do not seem to have borne much fruit, for we find the subject again returned to in the Final Report of this year:—

"Professor Masson's analyses showed that the water underwent decided improvement while stored in the Yan Yean Reservoir. They gave no positive evidence of constant pollution occuring during the passage of the water through the mains in Melbourne, but it has been noted that at certain times, apart from rainfall, the water is dirty. One sample of such discoloured water, when analyzed, yielded unfavourable results. In our Second Report we made detailed recommendations for the protection of the water-supply from pollution. Some of these recommendations have been partly carried out; others are, we understand, under consideration. We regret that, although we drew attention to the unfinished syphon when inspecting the aqueduct on April 19, 1889, and subsequently recommended in our Report, dated July 30, that the syphon should be completed at once, it still remains in its old condition, capable of delivering roadway and other drainage into the clear-water channel, and this, too, notwithstanding that the then Minister of Public Works in our presence gave instructions that it should be completed immediately. We trust that no further delay will occur in removing the two farmhouses from within the direct catchment area of the Yan Yean Reservoir. We regret that we are compelled to draw attention to the fact that many street-hydrants remain in dangerous positions, notwithstanding our urgent recommendation and the special report of the officer appointed by us. We would also suggest, again, that the water supplied to the metropolis should be analyzed at least once each month, and that the question of the filtration of the Yan Yean water on a large scale should receive careful consideration."

This last sentence touches on one of the most serious and radical deficiencies of this portion of the Melbourne water supply. It appears that this water, thus collected from a large surface area, undergoes no systematic filtering whatever! No wonder the Commissioners are anxious to keep the area uncontaminated; but they speak strongly also of the necessity for filtration works on a large scale being instituted. A large portion of the immediate catchment basin, however, is, it appears, permanently reserved and unoccupied, and the Commissioners add that the manner in which the portion of the reserved land immediately about the reservoirs is cleared, grassed, and planted, reflects great credit on the resident inspector. We come to the unsatisfactory side of the case again when the Commissioners have to speak of the state of the water supply mechanism in Melbourne itself. We are told that "all the mains, which have been laid for any time, tend to become choked to a greater or less extent by incrustations of rust and silt. Pipes of all sizes are affected. The silt is decidedly offensive. It consists largely of decomposing vegetable matter. But the analyses made by Professor Masson do not afford evidence that there is any constant contamination between the Yan Yean Reservoir and Melbourne, though they show that occasional disturbances occur, which render the tap water turbid."

Then does it not appear that the contamination, which consists of decomposing vegetable matter, has its origin in the reservoir itself? Another defect more than once referred to is the placing of street hydrants at too low a level, so that surface storm-water, carrying of course various impurities, runs over and may trickle into them. This is bad, and the removal of the hydrants (several times insisted on by the Commissioners) to more suitable and higher points should undoubtedly be carried out; but on the basis of the evidence we should not be inclined to attribute the unsatisfactory state of the water in the mains to this cause, unless to a very slight extent. The filtration is what is wanted, and the sooner Melbourne sets about it the better.

The third Progress Report deals with the subject of drainage and sewerage of Melbourne in a more special manner than in the First Report, and with some additional evidence, chiefly from experts. On this subject Mr. Mansergh has been consulted, and paid a few weeks' visit of inspection and inquiry, and we gather from the Final Report that a special report by him is in preparation, though the Commissioners express their regret that he did not or was not prepared to remain long enough in Melbourne to obtain the data for drawing out a detailed scheme of drainage, and the Commissioners express a fear that any mere sketch of a scheme, without details, "if prepared during a short visit and without full knowledge of local conditions, may cause embarrassment and delay. The Commissioners include in their report three schemes submitted to them by Mr. W. Thwaites, Mr. G. Gordon, and Mr. W. F. Bell. These schemes are embodied in the "Blue-book," with explanatory plans accompanying two of them. All three engineers recommended the separate system, with the admission of a small proportion of the earlier part of a rainfall into the sewers; one-tenth of an inch, it was suggested by one witness, was ample, though not too ample for getting all the cleansing effect of the rain in carrying off surface impurities. With a climate subject to violent rainfall of course any other but the separate system would be out of the question. It seems to be thought that the existing surface channels may be left to carry off the bulk, the clean portion, of the storm-water. But all the three engineers who submitted schemes concurred in this point at least, in emphatically advising the entire relinquishment of all relic of the pan system, and the adoption of water carriage alone, and we are glad to see that the Commissioners adopt this view in their report, though with some cautious expressions as to the possible insanitary effects of a water-carriage scheme unless carried out in the very best manner. This is perhaps a truism; in fact, any sort of sewage scheme must be carried out in the best possible manner to be satisfactory; but we doubt if the worst evils incident to an imperfect water-carriage scheme could be as bad as those which are almost inseparable from a pan system when applied to a large city as its only method of removal of excreta.

The final report leaves things in this position. The Commissioners recapitulate briefly their former recommendations about noxious trades—that these should be classified, and the more offensive ones distinguished from those which are not offensive unless negligently conducted, and that the former should be removed from their present proximity to population; and they thus state the result so far:—

"*The Public Health Act* 1889, section 32, enacts that no noxious trade shall be carried on without the consent of the local authority, and provides heavy penalties against offenders; it also empowers persons, whether resident in the district or not, to object to the continuance or extension of any such trade, and constitutes the Board of Public Health a board of final appeal whenever objection is taken to any consent given by the local council to the continuance and extension of such trade. Section 33 enacts that whenever there shall have been three convictions for nuisance after the passing of the Act, the local council may refuse to renew registration, and again provides for a final appeal to the Board. Section 41 enacts not only that every local council *may* prevent discharge of noxious matter into rivers, lagoons, &c., but empowers the Board when necessary to issue orders accordingly to the local authorities. The powers so conferred on both the local councils and the Board of Public Health are very large, and, in our opinion, if fearlessly exercised, will suffice to secure the necessary reforms. At present, however, the evil conditions described in our First Progress Report remain practically unchanged."

This is not very satisfactory, but it must be something for the Commissioners to congratulate themselves on that they have at any rate procured the formation of the legal machinery necessary for action, and it is to be hoped that this will not long be allowed to remain inert. In regard to abattoirs, which are classified separately from other "noxious trades," we learn that the Port Melbourne abattoirs were to be closed at the end of January in consequence of action taken by the Melbourne Harbour Trust, which resolved to pay £1,250 in compensation to get rid of this nuisance. But, adds the Report, "the South Melbourne abattoirs remain in the offensive condition described in our First Progress Report. The continuance of this establishment on Crown lands, under a so-called 'permissive occupancy' is, in our opinion, highly unsatisfactory, and likely to increase the difficulty of dealing with such establishments. Councils and private individuals can hardly be expected to conform promptly with the law, when such a place as this abattoir is permitted to remain, without any legal authority, on Crown land." In reference to the question of water supply, the Commissioners repeat and emphasise their cautions expressed in a previous report against too great confidence being placed in intercepting drains for the protection of the aqueduct; their recommendations as to a filtration scheme we have already referred to. The final report is largely occupied with a summary of the results of chemical and biological investigations as to the presence or absence of the germs of various diseases in the water. The conclusion of the report is that freedom from any water bacteria or water-borne germs may be ensured, in regard to the Yan Yean water, by the use of a pressure-filter on the pipe, and they add a brief expression of the very wholesome doctrine that "it is the duty of purveyors, and not of consumers of water, to see that a proper standard of quality is maintained." In conclusion, the Commissioners refer to the two legislative factors which must be looked to for effecting the sanitary improvement of Melbourne; one of them the Public Health Act, already passed, and just now referred to; the other the establishment of a Board of Works, which is still *in futuro*. If such a Board were to be a large body of which the members might be elected on political and partisan grounds, like another Board we have heard of, we should very much doubt its benign influence; but if the wise recommendations of the Commissioners are carried out, and a small Board of practical and working members appointed, they will probably be able to give a better account before long of the sanitary condition of Melbourne.

NOTES.

A SPECIAL meeting of the Institute (not largely attended) was held on Monday to announce the result of the general vote of members, by letter, on Professor Roger Smith's resolution passed at the meeting of March 31, the terms of which were given in our leading article of the 12th, but which it may be convenient to reprint here: it was as follows:—

"That while not opposed to the principle of compulsory examination as applied to those about to practise architecture, this Institute is of opinion that the difficulty of restricting by statutory powers the practice of architecture to those who have passed an examination is at present so insuperable that it is undesirable to make an immediate application for such powers."

The result of the voting was that 708 replies were sent to the circular, of which six were too late, and eighteen were put aside as informal. Of the remaining 684, 520 were "for" and "164" against. The majority "for" would probably have been much larger, proportionally, if a larger number of the members had voted, and also if the point

for consideration had been more clearly conveyed; for we surmise that it was probably not by any means clear to many, at all events to those who had not followed out the whole proceedings of the meeting of March 31, precisely to what effect they were voting; and we doubt if the Institute would not have done better for itself in "going to the country" with the original motion, in which it would at all events have been quite clear what was voted on and whence the proposition came, viz.: from people who under pretenee of benefitting the profession have been doing all they can to injure the Institute and bring it into contempt to serve their own purposes, though it now suits their tactics to proclaim the contrary. The resolution as sent out, it must also be observed, embodied an adherence in principle to the theory of compulsory examination, to which some who might otherwise have voted may have felt unable at the moment to commit themselves.

PERHAPS no feature of Mr. Goschen's Budget proposals will give more general satisfaction than the announcement that the Government intend to deal with the question of postage to India and the Colonies; and Mr. Henniker Heaton may be congratulated upon the measure of success with which his persistent efforts in the cause of postal reform have at last been attended. The existing rates to India, Australia, and the Cape range from 4d. to 6d., and it has long been urged that a uniform rate of 2½d. to all our colonies and dependencies should be established. Mr. Goschen stated that the Postmaster-General would endeavour to induce the respective Colonial authorities to agree to this being effected in future, by any route. It appears to be inevitable that the step will involve a certain amount of loss, but as it is highly probable that such loss will be greater during the first year than afterwards, it could not be introduced at a more fitting time. The country can best afford it now, and the Chancellor of the Exchequer has done well to make use of the opportunity now presented for dealing with this question. He could not, of course, definitely promise the reduction, but the announcement of his approval of the principle, and of his readiness to adopt it, will doubtless be responded to by our Colonies, who will, however, be called upon to bear some loss at first in connexion with the scheme. At home the proposal would not meet with much opposition in less prosperous times, and we should think that the concession would be equally appreciated in our dependencies. On Monday the postage of circulars was again mentioned in the House of Commons, and the Postmaster-General stated that it is being considered whether the Book-post rules can be modified in this and some other respects. It is notorious that circulars for home distribution are frequently sent abroad wholesale for re-posting to England, a saving being thereby effected by the senders, although the country must be the loser. It is high time that the existing rules were altered in some way. Altogether, the cause of postal reform appears to be in the ascendant just now.

WE learn that the Committee of the British School at Athens, in continuation of the scheme for collecting and publishing a series of drawings of the remains of Byzantine architecture in Greece, have decided to take up, but as a separate and distinct work, examples of the most typical churches in the Monasteries at Mount Athos. Mr. R. W. Schultz and Mr. Sidney H. Barnsley have already made a beginning with drawings of the Monastery of St. Luke, near Livadia, in North Greece, and are at present busy with the churches in Athens and the neighbourhood. They intend continuing their work in the interior of Greece for the present, but hope to be in a position to go to Salonica and Mount Athos towards the end of June, and to spend the summer there. They purpose making careful measured drawings of the architecture of the most important of the churches, and special studies of the most interesting portions of their detail, and they also hope to include a few of the finest mosaics and frescoes. A representative series of photographs will also be got together, and some time will be devoted to a general description of the various schemes of iconography. The architects also hope to measure several of the smaller brick churches in Salonica which have been insufficiently noticed in Texier and Pullan's work on Byzantine architecture. Mr. Penrose referred to this subject in a letter in our columns a few weeks since, and then mentioned that funds were much wanted to assist in this very valuable work of architectural illustration, and that subscriptions in aid of it would be received either by Mr. Walter Leaf, the Treasurer to the British School, at Old Change, E.C., or by Mr. E. A. Gardner, the Director, at Athens. We hope some assistance will be forthcoming towards this work, which is being undertaken by very competent persons, and the results of which may form a very important and interesting addition to existing illustrations of ancient architecture.

THE following letter from Professor Aitchison appears in the issue of the *R.I.B.A. Journal* for the 17th:—

"In the interesting account of the late Mr. J. T. Wood, of Ephesian fame, given by Mr. W. Papworth,* nothing is said of Wood's architectural works in this country. He built an office at the north-east corner of King-street, Cheapside (with one front in Gresham-street), and was the architect of the stations to some English railway. Possibly the requisite information about his works may yet be obtained. It would be superfluous to make any remark on the action of our Government in reference to the archæological researches made wholly or partly with public money. When a few of the marbles have been brought over and exhibited in the British Museum the Government considers it has done its duty, and all that is mainly valuable for improving our knowledge of antiquity is left to be done by the public spirit of the discoverers. Nothing has been published as yet but Wood's popular book, and now, alas! no further aid or information can be got from the discoverer. Are all his invaluable drawings, sketches, and memoranda to be left to the chances of destruction? Is nothing to be done to have these digested and published, and to obtain the services of a learned architect to make a restoration of the temple? Are no classical scholars and classical archæologists to be employed in writing an elucidatory text?"

Professor Aitchison, we see, has a letter in Thursday's *Times*, ably setting the matter before the public.

THE Royal Veterinary College, Camden Town, for which a new Museum is about to be erected, stands along the eastern side of Great College-street, and was established in 1791, with the Duke of Northumberland as president, under the not very successful management of a Frenchman, M. St. Bel. After his death, two years later, a committee was formed of some leading medical men of the day, including Abernethy and Sir Astley Cooper. We gather that the Veterinary School attached to the College has, at times, received aid from the State; yet it is only in this country, perhaps, that so useful and indeed so national an institution would be allowed to exist as a virtually private enterprise.

THE *Pall Mall Gazette* is often sadly at fault in its information about London matters, but it has never been more ludicrously wrong than it is in one of its "Occasional Notes" in its issue of Wednesday last, in which it says, writing of the London County Council, that "duty calls the Councillor now to Spring-gardens, now to Guildhall; one moment to the Mansion House, and the next to a sort of annexe in Craven-street." Further on, our oracular contemporary speaks, in the present tense, of "London's Parliament" as alternating "between sitting as a pensioner in the City and working in a two-pair back at home." From the context the writer of the "Occasional Note" is evidently quite unaware of the fact that the Council no longer sits at Guildhall; and we believe that it has never had the least occasion to appear for any purpose at the Mansion House, — which is primarily the official residence of the Lord Mayor, though a small portion of it is used as a police-court. Curiously enough, another column of the same issue of the *Pall Mall* gives an account of the London County Council "*at home*," in which it is stated that the Council assembled for the first time on Tuesday in its "enlarged and transfigured hall." Here again another blunder is made, for the members' seats are described as "radiating from a base formed by the daïs." The arrangement of the seats is really that of four concentric arcs of which the daïs may be said to form the chord. The intersecting gangways radiate, not the seats.

* See also the *Builder* for April 12, p. 267.

MR. THOMAS NELSON, publisher, writes to the *Scotsman* as follows, on the subject of the extension of Princes'-street:—

"The citizens of Edinburgh are rightly jealous of anything that would interfere with the amenity of Princes'-street—acknowledged by every one to be one of the noblest streets in Europe. From Waverley Bridge westward there is little to find fault with—the Gardens and the Castle Rock making it the admiration of visitors from all parts of the world.

But there is one blot at the East End, and that is the North British Railway-station, an unsightly jumble of a place quite unworthy of the city of Edinburgh. It has occurred to me that the matter is not yet past remedy, and that one of the greatest improvements that could be made to Princes'-street could still be carried out, and in a way to benefit the railway itself.

My suggestion is that the entire area of the railway station be converted into a 'grand place,' on the level of Princes'-street, with the railway-station, as at present, below, but greatly improved. I reckon that the area thus acquired would give to Princes'-street an extension greatly more than the entire area of St. Andrew-square. It could be made suitable for carriages, cabs, foot-passengers to the railway, and promenades. With a little architectural skill this new place might be made one of the finest features in the city. The cost, no doubt, would be considerable, but not more than I think might warrantably be spent between the city and the Railway Company. It would add greatly to the value of the railway property, and immensely to the beauty of Princes'-street."

The "grand place" over the railway-station would, we presume, be constructed after the manner of the Waverly garden over the vegetable market, the lights being placed in the centre of flower-beds. To make the place suitable for carriages would necessitate greater strength in construction. The thing could be done, but, as Mr. Nelson hints, the cost would be considerable.

IN connexion with the London University Extension Society, Mr. Arnold Mitchell intends giving six lectures, or rather three lectures alternating with three demonstrations on architecture, at 3 p.m. on successive Saturdays, commencing on May 3. The lectures will be given at Gresham College, and the demonstrations will be given successively at the Church of St. Bartholomew, Smithfield; Stone Church, Greenhithe; and at Westminster Abbey.

A NEW laboratory for electrical engineering has been instituted at King's College London, by the aid of a gift from Lady Siemens; it is to be called the "William Siemens Laboratory," and is to be constructed and fitted, we are told, with every modern electrical appliance. Dr. Hopkinson, the President of the Institution of Electrical Engineers, has been appointed the first professor in connexion with the Siemens Laboratory.

IT is stated in *Notes and Queries* that Sir Arthur Blomfield is commissioned by the Duke of Buccleuch, who is lord of the manor, to superintend the repairs of the Eleanor cross at Geddington, in Northamptonshire, and that the restoration will be carried out in a strictly conservative spirit. The cross, being triangular on plan, and about 40 ft. high, stands in the centre of the village. It bears the customary coat of arms of Leon, Ponthoise in Ponthieu, and Castile, and at top the figures of three queens lamenting. Nearly two years ago we published an account of its then condition, in an article entitled "A Tour in the Weldon Stone District," with some particulars of other similar crosses,

and of the royal progress from Herdrely to London.* The hexagonal cross at Waltham, which was at first constructed of Caen stone, having been set free from the Falcon Tavern which abutted against it, was a year or two ago restored by Mr. C. E. Ponting, architect; and in 1888 Mr. Hems, of Exeter, completed the sculpture.

OF the six invited designs for a Mausoleum for the Grand Duke of Baden, for which a site has been found in the Fasanen Garden of Karlsruhe, not one has been found suitable; and hence another design,—one in Early (German) Gothic, with an open timber roof, proposed by Herr Hemberger,—will most likely be carried out.

AN Exhibition of Architecture will be opened at Amsterdam on May 11. Designs (in drawing or model) of buildings erected within the last ten years, and also drawings or models for ideal projects or competitions made within the last six years, will be on view. A small collection of sketches and measured drawings will also be hung.

THE biennial general meeting of the combined Architectural Societies of the German Empire will be held in Hamburg this August. We will give some particulars as to the arrangements for this meeting at a later date; but it may be as well to note that the "Hamburger Architekten-und Ingenieur-Verein" are already hard at work preparing for the event, and that as some eight hundred guests from all parts of Germany are expected, the meeting promises to be a success.

THE *Building and Engineering Journal* of Australia (March 8) contains a report of a deputation of Sydney architects to the Mayor of that town, asking that in future municipal works should be thrown open to the profession generally, instead of being carried out by the City Architect. The deputation, through their spokesman Mr. Mansfield, said they believed New South Wales was the only part of the world in which Government buildings were wholly and entirely carried out by a Government architect. They were not considering a question of persons or of individuals, but one of principle; and he thought if the Mayor would take the matter into consideration he would be doing a duty to the public and conserve the great interests confided to his care. He also mentioned that, under the auspices of the Institute of Architects, certain rules were framed for the conduct of competitions, and which he thought were accepted by the profession generally as most desirable to avoid those evils frequently arising out of competitions; and he suggested, in the event of the views of the deputation being adopted, the advisability of adopting those rules. The Mayor said he had complete sympathy with the views thus put before him, and thought it more in accord with the spirit of the times to get the best results from the widest selection. He considered the City Architect's duty was really more that of an adviser, and it might be that different works in the municipality required different skill. We certainly think it is more for the architectural interest of a city that its principal works should be designed by various independent architects than that they should all be the work of one official mind, however able.

IN a recent report to the Local Government Board on the causes of the prevalence of diphtheria in the Tredegar Urban Sanitary District, Mr. Spear draws attention to the extraordinarily primitive condition in regard to sanitary matters in parts of this district:—

"The much-infected localities are alike in this, that the air about the dwellings is contaminated with sewage effluvia from defective drains and sewers. George Town South is provided with sewers, chiefly of stone and of the 'box' type, possessing two main outfalls and four minor ones into the river. The sewers in their outfall portion are laid with a steep descent towards the river, but the street branches have sometimes only a poor gradient. Privies are built right over them without the intervention of any pan or trap, so that sewer air comes freely through the closet seat. Slop-water gullies are likewise untrapped. Moreover, as the houses are built in terraces along the bank side, these direct openings into the sewers, affording the only means by which the latter, be it observed, are ventilated, are often in very confined situations; the slop-water gullies being generally, in fact, in a sort of well-yard or area, close by the back doors. A certain number of the houses, again, have no through ventilation, so that sewage effluvia often in such cases pollute the sole source of air supply.

In Vale-terrace, diphtheria, as I before said, concentrated itself upon one portion of the row; the further and smaller division, consisting of thirty-houses, entirely escaping. In the division affected a brick culvert, 3 ft. 6 in. in diameter, passes the whole length at the rear, some 24 ft. from the houses. The gradient is so flat that this sewer has habitually to be cleansed by the digging and scraping out of the contents; and yet the privies of every house empty over it, as in the case of the George Town privies, without any pan or trap; it is, in fact, one long cesspool, and the slop-water drains empty likewise into it."

THE exhibition of the Society of Painters in Water Colours is hardly one of the strongest; as usual, where it is strongest is in landscape. Mr. Alfred Hunt, however, is represented by only one drawing, a small view of "Windsor Castle" (212) from the opposite side of the river, seen under a peculiar effect of rich misty atmosphere. It is refreshing to meet the name of Mr. G. P. Boyce again, too often absent of late years: his one drawing, "Richard's Castle Church, Herefordshire" (197) is in his best style of delicate detail of buildings and foliage, and that peculiarly soft and aërial effect of sky in which he excels. Mr. R. W. Allan is working his recipe of brown buildings and bright blue spots of colour in his figures far too much; all his works are powerful in effect, but it is all one effect, unless we except "Machrie Bay, Arran" (182), which is a variation on the usual theme. Mr. Wilmot Pilsbury is more and more brilliant in his highly-worked realistic scenes, but the sentiment of nature is not there. Mrs. Allingham's finest contribution is perhaps "Blabre's House, Hampstead Heath" (11), a perfect work of art, in which a true picture is made out of the simplest materials; the "Cottage under the Copse" is another beautiful little work (113), remarkable, as usual, for the perfect execution and expression of the small figures that give human interest to the scene. Mr. Thorne Waite's chief contribution is a large field scene, entitled "The Blue Waggon" (59), with a waggon and horses going away from the foreground and forming with the figures in the waggon an admirably-drawn group as the centre of the foreground: the picture has more of open-air freshness about it than some of the artist's recent works, which have occasionally been over refined in sentiment, the landscapes of a dream rather than of real life. Perhaps the same charge might be made against Mr. Tom Lloyd's nevertheless beautiful work, "Rush-Cutters" (29), in which a long barge with some figures in it moves across below the parallel line of a level bank, with a harmonious decorative effect which makes one of the charms of the idyll. Mr. Napier Hemy has never done anything more fresh and more full of movement in the boat and the sea than "Bowling Along" (62). Mr. C. B. Philip, one of the more recent members, is one of the most powerful landscape painters in the Society now, and perhaps there is nothing finer and broader in style in the exhibition than his large desolate landscape, "Glen Feshie, Inverness-shire" (169), notable too for the truth of effect and texture conveyed along with this broad handling, as shown especially in the straggling river-bed with its broad pebble shoals. This truth of texture is what is wanting in Miss Montalba's otherwise effective drawings, as in "The Old Mill, Zaandam" (52), where the water is merely a pearly grey surface with no look of water about it; but her little sketch of the "Ponte della Paglia, Venice" (5), with its gaily-coloured groups, is a masterpiece of colour-poetry. Among other noticeable works are Mr. Goodwin's picture from "Sindbad the Sailor" (94), though this is not a scene of this earth, and on the whole we prefer his exquisite little paintings of what may be called city scenery; Mr. Herbert Marshall's "Arnheim" (22); Mr. Beavis's "Harvesting in Picardy" (87); Mr. Alfred Fripp's "Durdle Door" (90), with a wonderfully real effect of sunlight on the sea through a natural arch in the cliff; Mr. Robertson's "Serpent Charmer" (188), and "Le Roi S'Amuse" (154); but these brilliantly painted oriental scenes have little interest beyond that of brilliant execution; Mr. Jessop Hardwick's "In the Woods" (172), an exquisite painting of primroses; and Mr. Walter Field's "Hampstead Heath—a Hail-storm coming on" (186), a very fine piece of storm effect. Mr. Bulleid's classical marble and drapery pictures, "In Cynthia's Garden" (162), and "After the Bath" (181), are delightfully decorative in effect, but this is a kind of thing that is too mannered and conventional to retain its interest, in spite of much cleverness of execution.

THE collection of Anton Mauve's works at the Goupil Gallery consists mostly of studies and sketches, with but few finished paintings, as much even as he ever did finish. Mauve was a true painter in his feeling for the composition and sentiment of a scene, and in his perception of colour within certain limits; but a room full of his work has rather a depressing and monotonous effect, owing to the prevalent dinginess of colour and a certain smeariness of execution which goes very well with some of his subjects, but not with all. His "Cavaliers on the Shore" (21) is an admirable rendering of the appearance of a wide expanse of seashore seen from a sloping lane leading down to it, and the dark and pronounced effect of the figures and horses against the bright sand; and "The Flock" (22) is an admirable treatment of sheep in his peculiar way. "A Shower on the Heath" (41), and "Morning near the Canal" (68), are very good pieces of effect; in the latter the delicate way in which the faint morning light on the ground beyond the shadow of the dyke is just indicated is remarkable. His artistic feeling for composition and effect is nowhere better shown than in the little picture called "The Paling" (49), a mere corner of a field with a tree and some palings showing dark against the sky; but Mauve has made a real picture out of it. The painting called "The Brown Cow" (20) is rather exceptional in the collection, being much richer in colour than is usual with the artist; the animal stands in front of and half-shadowed by a dense dark mass of foliage, the feeling of the picture rather recalling the art of Troyon.

THE Executive Council of the British Section at the Paris Exhibition have published their Report, from which we learn that while throughout the Exhibition the average of awards was 50 per cent. of the number of exhibitors, in the British Section it was 90 per cent., and in the Industrial Section taken alone it was 120 per cent., double awards having been given in not a few cases. The Council complain of the manner in which the foreign exhibits were split up into sections in various portions of the building, so as very much to detract from their impression; the British and Colonial Section would they urge, have made a remarkable show if concentrated, whereas it was scattered about over no less than twenty different localities. The Executive Council give their thanks to the jurors, "who accepted without fee or reward a laborious and thankless duty." This, we believe, is painfully true in regard to most of those who actually did the work, though we believe some official honours were bestowed on honorary jurors who never went near the exhibits, while professional men who had left their work in England and were living for a long time at their own cost in

* See *Builder*, July 14 and October 27, 1888.

Paris, and giving unremitting attention to the labours of jurying, had the satisfaction of seeing the honours and the credit given to those who were only ornamental names.

FROM NEW YORK.

THE average American, it has always appeared to us, is never happy until he is a member of a society or organisation of some sort. The New Yorker is specially favoured in that, whatever may be his nationality, his creed, his avocation, or his social position, he can find in his own city a society of some sort to which he may become affiliated. There is a Holland Society for the descendants of the old Dutch Settlers; a New England Society for the progeny of the Puritans; a St. Patrick's Society for those of Irish descent; a Southern Society; an Ohio Society for the energetic and thrifty natives of that State, which is to the rest of the Union what Scotland is to England; each College has its Society, as has each profession; and so on down each rung of the social ladder.

We are led to dwell upon this national tendency in view of the fact that American architects have had, so far, no association or society which may worthily represent an important profession in the eyes of the public. There is, it is true, an American Institute of Architects, which has been in existence some thirty years or so, with the expressed object of "uniting in fellowship the architects of this continent, and combining their efforts so as to properly promote the artistic, scientific, and practical efficiency of the profession." The headquarters were originally, and have always remained, in New York; but local associations were formed under its auspices throughout the Union. The Institute has for years suffered from a species of dry-rot, which has impaired its usefulness either to the profession or the public, and the most that could be said for it was that a majority of its members were estimable individuals of a high degree of respectability. Other societies sprang up here and there in different cities, and finally, Chicago, jealous, as is its nature, of all that bears the stamp of New York, evolved a new association of its own. This was only a few years ago, but the Western Association of Architects, as it is termed, quickly outstripped the sedate Eastern Institute, as far as numbers, and probably influence went. This was, no doubt, due to the fact that all were fish who came to the Western body's net, and as long as the applicant for membership knew a T-square from a set-square, he was architect enough for the Association. That there is a sufficiency of smaller and more purely local bodies can readily be imagined, each one of which is, in a measure, diverting some element of strength from the two important societies above referred to. This being the state of affairs, it is with a lively sense of satisfaction that the profession in general has hailed the scheme for the coalition of these various opposing bodies and the consequent disappearance of annoying friction and clash of interests. This happy state of affairs is due to the labours of a Committee appointed some two years ago, and representing both the Institute and the Association. Each has given way somewhat, and a common ground for membership has at length been arrived at. The name of the American Institute of Architects has been preserved, and the new association will admit as members all practising architects, no matter what their professional ability. Local chapters will retain their individuality, and will be represented in the Institute by delegates, and it is hoped that thus constituted the body will elevate the profession, aid the individual architect, and raise the standard of architecture throughout the country. At a joint convention of the two organisations, held in Cincinnati, a couple of months ago, the President outlined the purpose of the new Institute as follows:—

"We have much before us in the line of improving the present system of designing our Government buildings, and in this we cannot hope to accomplish the needed reform until we are able to impress upon the public mind some of the principles which should govern the carrying out of such undertakings, and bring those in authority to see the manifest advantages which should be the result of placing the designing of buildings intended for different portions of the country and covering the widest range of materials and uses in the hands of professional men who were constantly dealing with the same factors and conditions in their every-day work.

A great deal might also be said in favour of a bureau of legal intelligence, which should include the best attainable talent, to be retained as a sort of district attorney for the whole association, to assist in defining and establishing the rights of the members who most stood in need of such service, and should also include the collecting and compiling of all matters of legal record pertaining to building interests.

We also need a better plan of education for our draughtsmen than that which is within the reach of the average student in an architect's office. It is of infinitely more importance that they should be able to detail a window-frame or other portion of a building in such a manner as to admit of its proper construction and service, or correctly compute the quantities and dimensions of a building, and make complete bills of material, than that they should design a Greek god in solid bronze (made of galvanised iron) to adorn the façade of a city front, or that they should be able to construct (on paper) some of those wonderful creations which are intended to be perpetuated for all time in hemlock scantling and shingles."

The subject of public buildings is an especially burning question in a country where millions of dollars a year are appropriated to this purpose, and where one monstrosity after another is the result. Mr. Richard M. Hunt, the leading New York architect, and the first president of the new Institute, said only the other day in regard to this very subject:—

"The way national buildings and public buildings are generally erected is a disgrace to this country. There is an architectural bureau at Washington from which the plans for all the post-offices and public buildings of the land are turned out yearly. A single man is in charge of this work. It makes no difference what his capabilities as an architect and an artist are. He has more buildings to plan each year than fifty conscientious architects would undertake. The result is that most of the public buildings of the land are practically planned by his employés—mere draughtsmen—men who would command no salaries on score of ability from an independent architect of any standing. Besides that, the nation's architect is saddled with the job of keeping all the national buildings the country over in repair. And all this he does for a salary which would not compensate a fairly-good architect in private business for his own yearly business. It is outrageous; it is no wonder that the country is filled with public buildings of hideous design and in bad repair."

An architect of our acquaintance, who is of a somewhat statistical turn of mind, so to speak, gave us some figures the other day, for the accuracy of which he vouched. "There are," said he, "in New York and its immediate vicinity over 800 practising architects—so-called. Of these there are not more than *thirty-five* whose names can be said to be fairly well-known. That is to say, thirty-five out of 800, or less than five per cent., make good incomes, while the remaining 765 starve more or less gracefully." This may be an exaggeration, but there is a modicum of truth in it, for while there is a vast amount of building going on in the city, there is not a great deal of architectural work apparent, and the number of capable draughtsmen out of employment must be very large.

The New Madison-square "Garden," which, when completed, will perhaps be the most elaborate and comprehensive edifice devoted to the purposes of amusement in America, is rapidly rising above the ground. Its position in the very heart of the city is enough to ensure it a constant patronage, even if the ingenious combination under one roof of a circus or amphitheatre, a concert-hall, a banquetting chamber, and a theatre proper should prove insufficient.

We are informed by Mr. R. Clipston Sturgis, the secretary of the Boston Architectural Club, that that body proposes to hold an exhibition of architectural work in the Horticultural Hall, Boston, for three weeks, beginning May 12, 1890, and that contributions are requested from all those who are interested in art and architecture. The exhibits will be grouped into seven sections, including sketches of historical buildings, &c., architectural designs, photographs of executed work, interior work, special exhibits illustrative of the allied arts, including stained glass, decoration, iron work, furniture, &c.

The Enlarged Council Chamber at Spring-gardens.—In our description last week it should have been stated that the scagliola columns were manufactured by Messrs. Bellman & Ivey.

MODERN INDIAN ART.*

THE arts of India in which we are most interested are, like ourselves, aliens to the country: they belong more to the military splendour of the conquering Mongols than to the pastoral simplicity of Aryan Hindu life. The period of Roman and Greek history which left such glorious remains in Europe is scarcely represented in India by existing monuments or works of importance, and, setting architecture aside, it is only by rich arms, metal, glass, and jade vessels, woven and embroidered stuffs, and such-like objects, from the time of Akbar, that we form the standard by which modern Indian art can be judged; and a glance into the history of that period is sufficient to show how very unfair it is to compare the objects produced under such very different circumstances with the ready-made goods offered to travellers by the *boxwallahs* and merchants of the Indian cities.

We do not know how far it was the system of Hindu princes to maintain in their Courts artificers of various trades, but as it is the custom amongst the higher class of Hindus to have many things made in their houses, either by members of their own family or workmen hired for the purpose, it is probable that the princes maintained a staff of workmen always engaged in producing for the Court. But as several of the Hindu princes use the Persian "Karkhaneh," or workshop, for this portion of their establishment, it may be that this custom was only introduced in imitation of the Moghul Court. It was in these royal *karkhanehs* that all the great work was done, and as these artificers were allowed to work for outsiders rich enough to pay them liberally, a very high standard of excellence was set, which the small workers of the bazaars tried to emulate.

Very much of the high quality of the work may be attributed to two great causes. Time was not of the slightest object, as the workmen were in receipt of regular allowances, and even their families were supported. Each of these courts also had what might be called a committee of taste in the leading artificers themselves—such as the master builders, jewellers, caligraphers, illuminators, and seal engravers—who were often professional draughtsmen, thoroughly skilled in the scientific as well as the artistic branches of pattern design.

There is no greater mistake made by many writers on Oriental art than that of asserting that the knowledge of ornament is instinctive with this or other Oriental nations. Speaking with more than twenty years' experience as a teacher and a traveller, I can confidently assert that everywhere there is about the same average of people who can draw and design instinctively. In some countries there are better opportunities, or a condition of affairs more suitable to the development of art; but in the individual the quality we denominate "good taste" and its opposite "vulgarity," are both fairly meted out irrespective of position or race.

There is also not that diversity of design which is so often mentioned in relation to Eastern ornament. On the contrary, although it is difficult to find two objects exactly of a size, yet there is very little variety in their forms or surface decoration.

These Eastern peoples have done in remote antiquity what we attempt from time to time, that is, to lay down rules for the regulation of form and colour in ornamental decoration. These are known to have existed amongst the ancient Egyptians, and a canon of proportion was settled by the ancient Greeks, and certainly exists in the art of the modern Greek and Russian Church. The Silpashastras of India not only refer to building, but also give rules for the preservation and reproduction of the forms and features of their gods, and use secret means for burying these ornamental forms in simple lines of writing, from which every curve and feature can be reproduced by anyone knowing the key.

Mr. James Wild, when studying in Egypt nearly fifty years since, found the Arab workmen producing geometrical designs by empirical means, rules of thumb; and Mr. Crace, some years back, in Damascus, was shown books of similar design which, however, he was not allowed to acquire. A few years later, in Persia, where I was completing the building of the Embassy, my workmen brought me, secretly, curious book rolls of design, both for plans and buildings, and every kind

* From a paper by Mr. C. Purdon Clarke, F.R.I.B.A., read before the Society of Arts on the 15th inst.

of ornamental decoration, floral and geometrical. These were not shown to people outside of their trade, but were learnt by the men, who apparently invented beautiful designs when called upon to show their skill. When at Jeypore, Major (now Colonel) Jacob showed me some patterns with rule-of-thumb methods for producing the curves of the ogee or cusped arches similar to those I had seen in Persia, and in Cashmere I came across certain bundles of paper closely covered with columns of writing in secret character, which a weaver could transform into the curve and colour of floral forms, or inversely; if given a design—no matter how complicated—he could translate it into these columns of written character.

All these belonged to the old system under which the Oriental arts were produced and perpetuated; and the high quality of the work was due to a slight development of the style in cultured hands, working their very best in court and temple for the approval of princes and the blessing of the gods. From this state of things we come to the totally different condition under which modern art exists, and, therefore, we should not wonder if, with causes so different, the results should not be the same.

Analogous changes have been at work all over the world, and if we look at home also it is easy to see that the arts of the past have very little in common with this positive, scientific nineteenth century.

In a few places, such as Jeypore, Ulwar, and Vizianagram, royal *karkhanehs* still exist, but somehow, owing to a mistaken sense of their utility, they could be scarcely said to be producing works of art, except at the Ulwar Court, where much decorative work is going on, and I found there a bookbinder who stated that his family had been in the Palace at Delhi from the time of Shah Jehan, and when driven out, after the Mutiny, they had been taken under the protection of the Rajah of Ulwar, a very intelligent and liberal-minded prince.

At Jeypore the *karkhaneh* had developed into a School of Art, in charge of a very well-intentioned Bengali gentleman, who, however, seemed to try to make it self-supporting, and consequently its productions were wanting in the true artistic character. . . . .

It was only towards the close of the last century that we began to leave our mark on Indian art. This we did by first of all attempting, as far as possible, to stamp it out, as we had succeeded in doing with our national Gothic and Elizabethan styles at home, substituting for it a bald and cold so-called Classical style which, in our houses, was about as far from the actual dwelling-houses of Greeks and Romans as it was from the beautiful Oriental exteriors and interiors we were endeavouring to supersede.

Instead of this paper, it would require a heavy book to describe our various attempts at raising monuments of shame for ourselves in India. And after running the gamut of the styles in Greek, Strawberry Hill Gothic, and representations of the several periods of Pointed architecture in colleges and churches, we eventually woke up to the fact that India had a style more suited to the country than any of those we had tried to introduce, and, without waiting to consider, at once started people who had little previous experience or education in Oriental design to erect important works, which, though certainly far more appropriate than any of our previous efforts, yet, unfortunately, will remain—as they are generally very well built—for a very long time as records of our want of appreciation of the essentials of Eastern art.

Not in architecture alone but in other ornamental arts has the same blind course been followed.

For more than twenty-five years Schools of Art have been established in different parts of India, and for a time their influence was most disastrous, although it was impossible to have procured better men as directors than the Government was fortunate enough in selecting. In all cases the directors of these schools were most enthusiastic about native art, but, unfortunately, they were fettered with a two-fold chain. On the one hand, they had in a manner to follow our system of art-education, which, do what we can, turns out more painters than designers; and, secondly, they had the wrong material in their students, and were cut off from the assistance of the master craftsmen of the art-trades, whose system of teaching was radically different from our own academic course.

As in Europe in the Middle Ages, drawing was taught in every workship in India, and every apprentice soon became skilled in the delineation of the ornamental forms used in his craft. He had no general education in drawing or ornament beyond this; therefore his mind was free from uncertainty and weakness in the treatment of his work. Here and there a clever man would introduce some slight change or improvement; and, if this was really good, it held its own, and was adopted by others, and thus the style slowly developed. Every detail in ornament had its special name, often apparently fanciful, but always with some hidden or symbolical meaning. There were quaint histories attached to many, and an unbroken thread of meaning running through all prevented any great alteration or interference.

As the apprentices learnt to draw,—sometimes with their fingers on the sanded floor, or with charcoal on a tracing-board,—they simultaneously learnt to use tools, whether chasing in metal, carving in wood, or weaving on a loom; and with this knowledge of what the tool could do always in their minds they did not depict upon paper inappropriate forms, or those impossible to be artistically rendered in the material they were treating; and the whole individual mind being concentrated on the one particular class of work, there was the necessary emulation amongst the fellow-craftsmen to perfect it.

But our earlier School of Art system changed all this. Drawing was taught independently of its application to any particular art; a jumble of styles, Greek and Gothic, and pictorial representations of natural objects, launched them on a sea of undigested ideas, without the restrictive rudder of the requirements of any one handicraft to guide them. All the workshop lore, the rule-of-thumb methods, and valuable tradition were absent, and replaced by vague ideas of a possible rivalry with Europeans in European processes, to be rewarded by a European scale of pay.

Against this system the later School of Art masters had to struggle, and Bombay, Lahore, and Madras did so with some success by turning their schools into art workshops, where the pupils learnt and practised ornamental handicrafts, as well as drawing; and there is no doubt that had there been any combined system of working together, or had the Government shown the slightest true consideration for them, a very great success might have been secured, as also with respect to the great jail manufactories of carpets. But all the Government really cared for was to make their art workshops self-supporting, and, therefore, the superintendents were forced to work down to the level of mercantile people who only wanted cheap goods.

I do not wish in any way to blame the superintendents of these institutions, on the contrary; they have only done their duty, and I believe they have been in constant strife with the authorities in trying to bring about a better state of things, and invariably with the same result, that when, after several years' insistence, they at last succeeded in getting a consideration of their proposals from the Central Government authorities, — who, in India, rule all matters,—the short term of office of the high officials expired, and the superintendents had to start all over again. . . . .

The arts of stone and wood working are in India very closely connected, both in Hindu and Moghul architecture. The two very different modes of construction are so mixed, and borrow so much from each other, that it seems almost a principle that the masons treat stone like carpenters, and the carpenters use wood after the fashion of masons, in solid masses, depending upon weight for stability. The modern form of both arts, excepting in Nepaul and the extreme south, has become distinctly Saracenic, retaining always certain peculiarities of the Hindu style, which stamp it with a distinct character, and separate the Hindu Saracenic styles from all other varieties of Mohammedan architecture. . . .

For native use, architectural wood-carving is still a very important industry, and I question whether it has in any way deteriorated. It is so important and widespread that I cannot attempt even to give the leading districts of its production, as I should fail to do justice to the subject for want of space. There remains, therefore, only to notice the inlaid furniture of Hoshiapur, in which *shishan*-wood is inlaid with ivory—often with the most graceful and happy effects—in Saracenic style, and the purely Hindu carving of Mysore and Kanara, which, for finish, is unequalled in any part of India. The decorations of the latter, unfortunately, are merely transcripts of the designs used in the temples, both wood and stone, and although most exquisite in execution, and often in drawing and composition, the reckless use of labour in their production places them above the reach of ordinary commerce, and the faulty construction of the objects makes them unsuitable for any practical purpose.

Stone-carving belongs principally to the North-west Provinces and Rajputana, and here, again, is an art which cannot in any way be said to have lost ground. All travellers in India know the wonders of the past, the temples at Abu, Abkar's dream in stone at Fathipur Sikui, and the Taj Mahal; but if they doubt that it is possible to emulate these works, it is only necessary to visit the modern cities of Khorja and Bulanshar to see that natives, working for themselves, can still design and do all the work they produced in the old time. Then the college buildings at Ajmere, Colonel Jacob's People's Palace at Jeypore, Mant and Chisholm's royal buildings at Baroda, and Chisholm's Government buildings at Madras, show how much can be done where Indian and European work together; and we should be thankful for a movement in the right direction in time to save us from the reproach of having destroyed a school of architecture which, if it could not claim to rank amongst the great styles of the world, yet at least had many beautiful features, and was certainly the most suitable to the country and its mixed races. . . .

In conclusion, I am forced to repeat that a very great responsibility rests upon ourselves for the part we have taken in destroying the ornamental handicrafts of India. Nor is this much lessened by the costly efforts in recent years to save ourselves from this reproach. Whilst handicrafts are perishing before our eyes, which in many instances are all that is left to us of the great arts of antiquity, we are squandering large sums on antiquarian historical research in India of little practical value. We have spent over 30,000*l.* in useless copies of the cave paintings at Ajanta, and yet we are allowing the few craftsmen to die out who possess the secrets of some of the noblest arts of antiquity, such as true fresco paintings; not the half-wrought work of the Middle Ages, but the marble-like, hard, silicious work which we find at Pompeii, and still practised in India.

The reason of all the anarchy and destruction we have introduced into the artistic productions of India is our failure to appreciate the great value of workshop lore and rule-of-thumb trade secrets, which all the colleges and schools in the world can never replace when once lost; and, worst fault of all, our habit of considering art questions as mere matters of individual taste, and not as appertaining to a science as positive as any other, and only more difficult owing to its vastness, and the want of common agreement as to its terms.

It is to the preservation of the old workshop traditions that we should devote our energies if we are in earnest in all our talk about preserving the industrial arts of India. It is this workshop life of master and apprentice, as old as when Jacob served Laban for seven years, that brought these arts into existence, and only these conditions will in any country maintain true art in vigorous life. Great craftsmen like William Morris and Herkomer have realised that this is the only way of salvation in the ornamental arts, and if there is to be any future for our now middleman-crushed arts, it will come from work produced under such happy conditions as exist at Merton and Bushey.

Last of all, the Indian Government cannot clear itself from blame by spending annually a large sum of money on schools of art, museums, and archæological work, when it neglects every opportunity for giving effect to the repeated statements of its desire to encourage native art. When presents are exchanged with Indian and other Oriental princes, the best craftsmen in the country should be employed to prepare the gifts, and a fashion set to the princes and wealthy, who would gladly follow such a thoroughly Oriental and congenial example.

The newly-built palace of the Viceroy at Simla afforded such an opportunity, but instead of illustrating the art resources of the country, even from the School of Art point of

view, and overlooking the fact that the fastidious Rothschilds of Paris, and Vanderbilts of New York, were obtaining furniture and decorations from Bombay, the Viceroy in Council handed over the decorations, upholstery, and furnishing to an advertising firm in the Tottenham-court-road, London. It is not to be wondered, therefore, that with this example, the Gaikwar of Baroda followed suit, and, flying a little higher, furnished his palace from the Faubourg St. Antoine at Paris.

There is only one remark I wish to add, and that especially for any Indian gentleman who may be present. I most sincerely believe that as the rulers of India we have ever had but one idea, and that the amelioration of Indian peoples; and if, in carrying out this idea, we have neglected or injured native Indian art, it has been from the same mistaken good motives which led us, during the same ill-starred period, to neglect and injure our own indigenous English art. If we introduced a travesty of Classical architecture in the last century at Calcutta, and have since filled the palaces of rajahs with libels on French furniture and decoration, we were doing the same at home; and if, some years back, the museums of Calcutta and Madras contained English art pottery, Italian stone carvings, and pictures, whilst Indian art works were conspicuous by their absence, we in England, to this day, show just as little respect in our national museums for English art, taking no trouble to systematically collect examples to illustrate its history, although we pay the highest price of any of the nations of the world for anything in the shape of a foreign "curio."

THE SURVEYORS' INSTITUTION.

THE following Student Candidates have passed the examination for the Professional Associateship:—

Aylen, Cecil Hugh, London Colney, St. Alban's, Herts.
Bancroft, Frederick Herbert, 83, Mosely-street, Manchester.
Barclay, Thomas, Lonsdale House, Alcester-road, Moseley, Worcestershire.
Beadel, Maurice Frederick, 97, Gresham-street, E.C.
Buckland, Herbert Tudor, The Oaklands, Augustus-road, Mosley, Birmingham.
†‡Cobham, George William, 3, Edwin-street, Gravesend, Kent.
Garrard, Arthur Norman, 8, Kensington-court, W.
Green, Alexander Ernest, Kingsdown Lodge, The Common, Ealing, W.
Hampton, George Frederick William, 8, Pall Mall East, S.W.
Hayward, Frederick George, 4, Warwick-road, Upper Clapton.
Lake, Vivian Davey, 17, Glanville-road, Tavistock, Devon.
Leaning, Henry John, 60, Holland-road, Brixton, S.W.
*Merry, Arthur Walker, Southcourt Farm, Leighton Buzzard, Beds.
Molyneux, Herbert Ernest, 83, Cazenove-road, Stamford Hill, N.
Nockolds, Alfred George, Castle Hill House, Saffron Walden, Essex.
Ogden, Michael Guy, Wensleydale, Lingfield-road, Wimbledon.
Potter, Herbert George, Gardnor House, Hampstead, N.W.
Savill, Edwin, Chigwell, Essex.
Smith, James, 8, Oxford-street, High Wycombe, Bucks.
Spelman, William Walter Rix, Ivy House, Eaton, Norwich.
Summerfield, Joseph Charles, Stafford Villa, Forest Hill, Kent.
Swainson, Francis Charles John, Forest Row Vicarage, East Grinstead, Sussex.
Verity, Ernest George, 38, Cathcart-road, S.W.
Watson, Claude Henry, 35, Lincoln's-inn-fields, W.C.
Webster, Hugh Calthrop, 97, Gresham-street, E.C.

The following Non-Student Candidates have also passed the Examination for the Professional Associateship:—

Armytage, Francis Reginald, 4, Pump-court, Temple, E.C.
Body, Arthur, Cliff Cottage, Chippenham, Wilts.
Booth, Gilbert William, Longstile Talke, Stoke-on-Trent.
Boulting, Frederick Edward, 30, Mornington-road, N.W.
Brackett, Frederick Henry, 23, Rona-road, Hampstead, N.W.
Cope, Henry James, 30, Westbourne-street, Eaton-square, S.W.
Desborough, Charles Ernest Maitland, 16, Moor-street, Lennox-gardens, S.W.
Elgood, Frank Minshull, 98, Wimpole-street, W.
Ellis, Francis, Chart-road, Reigate, Surrey.
Fraser, William, 209, St. Vincent-street, Glasgow.
Forrest, William, 27, Windsor-terrace, Penarth, near Cardiff.
Griffiths, Harold, Architects' Department, School Board for London, Victoria-embankment, W.C.
Grozan, Hedworth Herbert, 125, Piccadilly, W.
Hodgkinson, James Henry, 3, Ash-view, Stalybridge.
Innes, Gilbert Plantagenet Mitchell, Avon House, Downton, Salisbury.
Kay, Walter Robert, Mount Sion House, Bury, Lancaster.
Larkin, Richard Webster, Cowley House, Cavendish-road, Balham, S.W.
Lewis, Arthur Llewelyn, 12, Arminger-road, Shepherd's Bush, W.
Mould, Graham Harley, 14, Grange Park, Thornton Heath, Surrey.
Oakley, Harry Ekermans, 83, Elizabeth-street, Eaton-square, S.W.
Oakley, John Hubert, Cromlix, Chislehurst, Kent.
Osenton, George, jun., Westerham, Kent.
§Partridge, Edward John, 22, Fleet-street, E.C.
Pinder, Richmond, 49, Upper Baker-street, N.W.
Prall, Herbert Edward, Frindsbury, Rochester, Kent.
Rogers, Thomas George, 40, Primrose Hill-road, Hampstead, N.W.
Slater, Charles Frederick, 5, St. John's-road, Richmond, Surrey.
Smith, James Frederick Kemp, Market Harborough, Leicestershire.
Snailum, Walter Wadman, 33, St. George's-terrace, Trowbridge, Wilts.
Townsend, George James, The Nook, Trafalgar-road, Twickenham.
Wood, Edward Bryan, Langley Green, Chippenham, Wilts.
Wood, Charles Bruce, 37, Irene-road, Parson's Green, S.W.

The result of the examination for the Fellowship will appear next week.

* Institution Prizeman, 1890. † Special Prize, 1890.
‡ "Crawter" Prize for Field Work, 1890.

CRYSTAL PALACE ENGINEERING SCHOOL.

ON Saturday, on the closing of the Easter term, Professor Francis Elgar, LL.D., F.R.S.E., C.E., Admiralty Director of Dockyards, presided at the usual meeting of the students and their friends, and others interested in the school, and presented the certificates awarded by the Examiners, who were, on this occasion, Mr. F. Wentworth-Shields, C.E., and Mr. J. P. Knight, A.M. Inst. C.E. It was mentioned in the course of the proceedings, that thirty-five years ago Mr. Wentworth-Shields had been intimately associated with designing and superintending the construction of the tower in which they were assembled, and that Mr. Knight, his co-Examiner, had passed through the school as a student.

Professor Elgar, in his address to the students, referred in complimentary terms to Mr. A. M. Struben, a student from South Africa, by whom the award of the medal of the School had been achieved in his having obtained the necessary nine certificates, an evidence of all-round merit more honourable and difficult of attainment than the highest place in single subjects, and well worthy of emulation. To pass well in examination was, of course, most satisfactory, but the after career of the student as an engineer might not correspond with his place in the examination-list; his success would depend upon the manner in which he applied his knowledge, and power of adapting himself to new conditions and circumstances as they occurred. The students who were comparatively low in the examination might, in the future, attain a higher place and greater success than their rank in the examination-list might indicate. There were accidents that interfered with their success, the state of health, not being in good form, errors of judgment, and other causes. The best students did not always turn out the best engineers. On the other hand, it should be remembered that the examination questions did not reach all the useful knowledge of which a student might be possessed, or disclose the qualities essential to success with which he might be endowed.

The Professor then presented the certificates.

The lectures for the term were on "Steam and the Steam-engine." The highest number of marks attainable was 296. Sixty-three students attended the lectures; fifty-eight were eligible for examination, thirty-six passed satisfactorily and obtained certificates. Mr. H. E. Heald was first with 263 marks; Heald was also first in the order of merit for work in the Fitting-Shop. Mr. F. D. Maw was second in lecture examination with 243 marks, and an equal first for work in the drawing-office.

In the Drawing-Office nineteen certificates were awarded; T. Nitta, an equal first, with certificate, 197 marks, for lecture examination.

For work in the Pattern-Shop twenty-one certificates were awarded. A. F. Franks and G. H. Laidman equal firsts; the last-named had also a certificate for lecture examination, 205 marks.

For work in the Fitting-Shop, eighteen certificates were awarded,—Heald, already-mentioned, first.

For students of the second year's course,—civil engineering,—F. W. Wheadon was first for students of the first term; E. M. Proes for students of the second term; and A. M. Struben (medallist) for students of the third term.

In the Colonial Section, four certificates in three grades were awarded, O. C. Ormsby being awarded a certificate of the first grade.

In his address at the close of the proceedings, Mr. J. W. Wilson, Principal, stated that 832 students had passed through the school, and that he had trustworthy intelligence concerning 370 of these, who were occupying responsible professional positions.

The usual votes of thanks concluded the proceedings.

§ Driver Prize, 1890.

THE SANITARY INSTITUTE:

EXAMINATIONS FOR INSPECTORS OF NUISANCES.

AT an examination held for Inspectors of Nuisances, April 17 and 18, 1890, 120 candidates presented themselves. Questions were set to be answered in writing on the 17th, and the candidates were examined *viva voce* on the 18th.

The following candidates were certified to be competent, as regards their sanitary knowledge, to discharge the duties of Inspectors of Nuisances:—

Abbott, A. R.	Groom, W. E.	Saunders, P.
Baron, W.	Halstead, R.	Savory, C.
Bond, G.	Harris, F.	Simpson, J.
Chambers, M.	Holland, P.	Smith, J. S.
Clifton, H. C.	Johnson, J. W.	Smith, W. H.
Corrick, A.	Knight, R.	Taylor, J.
Craven, W.	Lightfoot, W. C.	Thomas, G.
Crocker, T. W.	Malcolm, A.	Thompson, J. R.
Davies, T. L.	Moody, H. F.	Tomkins, A.
Dawson, W.	Mosley, A.	Turner, A.
Dick, W.	Nutley, C. V.	Walker, F.
Folland, J. P.	Oliver, G.	Walker, W. S.
Forrester, W.	Parham, J.	Wallis, A. G.
Gander, H.	Perman, E.	Wansbrough, C. S.
Gee, C.	Quaintrell, H.	Wharton, H.
Gibbs, A. G.	Ridler, W.	Wrack, T. P.
Graves, M. D.	Ruscoe, E. H.	

THE LONDON COUNTY COUNCIL.

THE London County Council held its first meeting in its enlarged Council Chamber at Spring-gardens on Tuesday last, the Chairman, Lord Rosebery, presiding.

Review of the First Year's Work of the Council.—The minutes of the last meeting having been read and confirmed, the Chairman said he had hoped that day to have been able to lay on the table the annual reports of committees, but unfortunately many of them reached him late, and two of them had not yet arrived at all, and therefore it would not be possible for him to do so. In the meantime, he would commence the review of the year that he proposed to lay before them, and he would continue it at their next meeting.

Council Chamber and Office Accommodation.—His (the Chairman's) first pleasant duty was to bid them welcome back to their home. He hoped that the hall in which they were assembled would be found, probably not so magnificent, but more available for work than the Guildhall. He did not think they could ever sufficiently express their gratitude to the Corporation of London for their hospitality in that hall, but at the same time he thought, without looking a loan horse in the mouth, that he might say that utility had been a little sacrificed to magnificence, and he thought that very often false issues were raised and divisions took place under a mistaken apprehension, because of the bad acoustics of that building. If gentlemen seated on one side could not hear arguments advanced on the other it was quite clear that no satisfactory conclusion could come before the Council for decision. Later on in his speech, the Chairman

said on this subject that it would be ungrateful at that meeting not to notice the work of the Council Chamber and Offices Committee. Of them it might be said, "*Si monumentum requiris circumspice.*" Of course, it was too early to pronounce definitely on the merits of that chamber. The only thing that they cared very much about was that it should be well ventilated, and that it should be a good room for hearing in; but at any rate it was not too early to congratulate the Committee and Mr. Blashill, their Architect, on the very handsome apartment that they had furnished them with. But they had even more important work than that. Owing to the constantly developing work of the Council they had had to hire 8 and 17, Spring-gardens, 56, Charing-cross, and 40, Craven-street, Strand; and the Chairman of the Committee thought they would soon have to hire another. [Sir W. de Souza: I believe so.] The Chairman, continuing, said that was five houses that they had already to hire outside their own building. Though they might be able to get along for a certain time with that as a make-shift, they could not permanently hope to conduct their business efficiently in them, and it was under that impression that the Council, some short time ago, by a majority of 9—a small majority under the circumstances—determined that this Committee should have authority to look out for a site for the new offices. He did not understand that it was the intention of the Council that they should get a site or try to find a site regardless of expense or other considerations, but it was placed in their power, if they found such a site, to report that they had found one to the Council, and nothing more than that. He believed that they were still looking out for a site. Of course, sites did not commonly occur in London of the magnitude required, but he himself did not anticipate that the selection would fall to the present body.

The Work of the Committees.—Speaking of the work of the various Committees of the Council, the Chairman said that one difficulty that they had had to contend with in regard to the Committees was that some of them at times overlapped each others' functions and work, but it was marvellous, considering in how great a haste the first references to these Committees were settled, how successfully on the whole they had been enabled to be carried out. The Housing of the Working Classes Committee had overlapped the Sanitary and Corporate Property Committees on several points, but by their simple system of conferences this overlapping did not present any serious complexity, and he did not know why it should in the future.

The Housing of the Working Classes Committee had sent in their report, and they stated their wise resolution, as he thought it, not to take rapid or inconsiderate action that might prejudice their future usefulness, but to view their vast field of operations as a whole. He remembered when the Committee first began a good many members said, "Let us do something at once to show that we are in earnest;" but he believed the Committee, as a whole, chose more wisely in determining not to do something at once without the most ample consideration, because to put their foot forward and draw it back in a matter of such importance could not but affect seriously the character for sober acting of the Council. They subdivided themselves into four geographical sub-committees, and they collected from Vestries, District Boards, public boards, and private companies all available information. They had further examined the state of the law, and come to the conclusion that amendment or consolidation was imperatively required. They urged this view on the Home Secretary, and consolidation had been promised by the Government; and he did not doubt that the further recommendations of the Committee,—one having been so favourably entertained,—were also under the favourable consideration of the Home Secretary. The Committee further represented that the amendment of Torrens's Acts was necessary if effective action was to be taken with regard to insanitary areas. That this question was urgent was apparent from the fact that the Committee had had under consideration no fewer than 198 insanitary areas, most of them small. They found great difficulty in working Torrens's Act in regard to these insanitary areas because they had to work them through the district authority, and the district authority preferred working them through Lord Cross's Act, but he hoped they might expect from the Government some assistance in the matter of the amendment of that Act. The Housing of the Working Classes Committee had not been content with this. They went to Glasgow, if not to other towns in the north, and made a very careful inspection of the municipal lodging-houses in the second city of the Empire. They would see by the very careful and able report which the Committee had laid on the table that they had now come to the conclusion that they would take action as the result of that experience and learning. He should propose to defer the consideration of the report as to municipal lodging-houses for at least one week in order to give fuller time for its consideration.

The Parks Committee illustrated very strongly and strikingly the result of popular as compared with indirect election. The late Metropolitan Board of Works felt an interest in parks, but it was not an interest that came from a direct impulse, and he might illustrate that by saying that, whereas in nine months the Parks Committee of the late Board only held twenty-four meetings, the sub-Committees and Committees of the parks now held no fewer than 129. The fact was the members came from their constituencies, finding those constituencies greatly in earnest about the parks question, and with that impulse they set themselves to work with great vigour to deal with it. They divided themselves into four geographical committees, besides again sub-committees, and they knew from their reports with how much earnestness they set themselves to visit the localities which they superintended.

The Main Drainage and Bridges Committees.—There were two committees which were united by the interesting link of the Engineer—the Main Drainage Committee and the Bridges Committee. The Main Drainage Committee, as they all knew, was one of their most important committees. It had before it probably the greatest problem of any of their committees, and they had suffered very much from the unfortunate fatality that had beset the post of Chief Engineer of the Council. When they considered that Sir Joseph Bazalgette resigned at the commencement of the Council; that after some time taken up in selecting a successor for the vacant post they were fortunate enough to find Mr. Gordon, but unfortunate enough to lose him at the time he had received their whole confidence; that Mr. Dunscombe was attacked by ill-health as soon as he took office, they could well understand the difficulties under which the Main Drainage Committee had laboured during the past year. They wanted every assistance that the Council could give them, and he was sure that his friend Mr. Arnold, the Chairman, would not deem the assistance of any one superfluous in dealing with the vast problem before him. What was the problem? Grave complaints had arisen from the inefficiency of the pumping machinery, and that at any time in the heat of summer a state of things might arise which might produce a most poisonous condition of the metropolis. They had therefore to consider what was required in the way of the repair and reconstruction of the pumping machinery. They had taken over from the Metropolitan Board of Works contracts for an enormous amount—Barking outfall works, 448,567*l.*; similar works at Crossness, 259,816*l.*; sludge vessel (Barking), 24,785*l.* They had had before them the question of the sludge vessels, which was not merely important as raising a vast string of questions, but also as involving the whole position of the sewage system. The sludge they had to take to the sea, or get rid of in the sea, or somewhere or other, was no less than 70,000 tons a month. The Council had shown a reluctance to lay down a principle, that it would abolish this system of taking their sludge by vessels, and they had endeavoured to get time with regard to the consideration of the problem by telling the Committee to hire sludge-vessels as a make shift. The Committee reported that it was impossible to do this, and although they were able to carry on for the present, they could not very well long postpone the consideration of the great problem which would force itself upon them before the summer recess. In the meantime it was engaging the attention of the Committee. Their main drainage works were planned for London at a time when the population of London was 2,000,000 less than it was at the present moment, it was daily increasing, and, furthermore, they would have places like Erith applying to be included in their main drainage system; therefore, he thought they had a problem before them which he did not exaggerate in saying was by far the greatest before the Council at the present time. The Council had authorised Sir Benjamin Baker to confer with their present Chief Engineer (Mr. Binnie) as to the best means of dealing with this problem. He believed that in acting in that way the Council had behaved wisely in not rushing to a decision with this drainage problem hanging like the sword of Damocles over their head. The other committee which was connected with the Engineer specially was the Bridges Committee. They had not a long report to send to them, but they had had the Free Ferry at Woolwich to superintend. Members would remember that up to within a day, he thought, of their coming into office they were called upon to open the Free Ferry at Woolwich. He was ordered by the Council to open it, which he did very silently and very reluctantly, because he felt that in opening that ferry they were opening something with which they had nothing whatever to do, and that the honour of opening it should have fallen upon his predecessor in that chair. However, as the Metropolitan Board of Works would not open it, it fell on the Council to open it, and he thought they might congratulate themselves that their very first entry into office coincided with a very great boon to the people. Two and a half millions of people had crossed by that ferry already. That alone showed the advantage it had been. The Bridges Committee had been very much taken up with the re-building of Battersea-bridge, the completion of which was promised for April, but owing to the difficulty of obtaining iron work it would not be open, he was afraid, till July. That was not the fault of the Committee, who had given it all the attention that had been in their power. But, of course, the real problem before the Bridges Committee was one which he hardly dare mention, he meant the Blackwall Tunnel—means of communication at Blackwall, the "provisional works" at Blackwall: as long as he remained in that chair he would never give way to the word "experiments." There was a feeling about the Blackwall Tunnel, that he was afraid prevailed largely in the Council, that they would just as soon hear its name mentioned as that of the coal and wine duties.

Among other Committees whose work was referred to by the Chairman were the *Asylums Committee* and the *Fire Brigade Committee*. The Chairman, having spoken for three-quarters of an hour, postponed the conclusion of his review of the work of the Council until next week.

On the motion of Mr. Boulnois, M.P., seconded by Mr. Lemon, a vote of thanks was passed to the Council Chamber and Offices Committee; and it was also resolved to print the Chairman's statement *in extenso*.

The Council having transacted a great deal of miscellaneous business, and taken its first division in the new lobbies (which resulted in a tie, 43 to 43, on a proposal of the Parks Committee to take over certain open spaces, the Chairman declining to give a casting vote), adjourned, after a sitting of nearly four hours.

The English Iron Trade.—There has been a further depression in the English iron-market this week, the demand being exceedingly quiet on the part of users, who expect to see lower prices still, while producers are unable to offer anything at ruling rates, considering the cost of production. From all pig-iron centres the reports show a very dull market and lower prices. A large business has been done in Scotch warrants, with quotations going down steadily. Scotch makers' iron is quoted from 6d. to 2s. 6d. per ton less. Cleveland pig has lost 1s. 6d. per ton during the week. Hematites have declined to a like extent. Spiegeleisen has been depreciated 30s. a ton since the beginning of March, and old materials are from 15s. to 20s. lower in prices. The manufactured-iron market is very quiet, values having receded from 2s. 6d. to 10s. on the week. Although steel works are, as yet, fairly well provided with orders, there is very little new business, and steel is cheaper to the extent of from 2s. 6d. to 7s. 6d., and even 10s. Shipbuilders are not looking forward with any great confidence, while engineers are taking very little fresh work.—*Iron.*

Illustrations.

UNITED STATES TRUST COMPANY'S PREMISES, NEW YORK.

THIS building, of which we give a view of a portion of the front, is designed by Mr. R. W. Gibson, an English architect now settled in New York. The illustration, as will be at once seen, is from a photograph taken from the actual building, a fact which explains the presence of the motley group of boys who have introduced a human element in the illustration which we could well have spared. The photograph being a very good one otherwise, and the building a good representation of what may be said now to be the modern American style of architecture, we give it as it stands.

The building was the subject of a competition in which Mr. Gibson's design was successful. We append plans of two floors; and the following quotations from the report sent in by the architect with the design will furnish some further information as to the intention and construction of the building:—

"The style adopted is Romanesque. This may fairly be said to be the National style of the United States, and it is the only one distinctly deserving that title. In its ready adaptability to modern purposes it has assumed new beauties, without losing those more ancient. The unaffected dignity of large buildings is perfectly expressed by it. The severest simplicity is permitted in it, and the most elaborate and fanciful carving. It is eminently practical in its construction and weather resistance. It demands no useless expenditures in cutting and polishing facings and pilasters. These are the reasons why American architects are so rapidly appreciating the Romanesque style.

The front is designed with the stories grouped in tiers of carefully-studied proportions.

The first story and basement are massive and almost severe. The second story is of rich horizontal composition, as a finish or ornament to that below. Then the three succeeding stories are grouped in a central tier, expressive of their purpose, with large, round arches resting upon handsome carved capitals. Upon these is one story absolutely plain, for the sake of repose and apparent weight, giving a due importance to those below. The remaining stories form a cornice group. They are designed with long shafts and high proportions, so that they will be effective even when viewed from the somewhat narrow streets.

Kibbe sandstone and Millford granite are recommended as the materials, although the design could be equally well rendered in others.

An entrance, enriched more than the other parts, gives access to the principal floor. This is raised a few feet above the street level, so as to obtain command and importance, and it affords the advantage of light to the basement, and lesser depth of foundations. The floor can be made nearer street level if desired.

Whether with or without a renting basement the entrance is designed to occupy the height of principal story.

The insignificant doorways of many modern buildings of great pretension are sufficient arguments in favour of this arrangement.

The windows of the front are of ample size for perfect lighting, and the external effects are obtained without making any of them inconveniently high or low within.

The windows of the banking room, and nearly all others, have straight heads close to the ceiling, admitting the most valuable light.

All windows are simple sashes of plate glass.

The stonework of the front is all of genuine, massive, truthful character, with no concealed iron supports or imitations. The elaboration by carving can be increased or decreased to any degree required.

The main entrance hall is lighted by the great doorway, and, in addition, by the very large open space only partly occupied by the elevators and stairways. This is 36 ft. long and over 8 ft. wide, built with glazed brickwork and other finishings to reflect the light.

The floor of the public halls and the banking department are to be of Roman mosaic.

The wainscotings are to be of Champlain marbles, mostly white, with relieving mouldings and bands in colour, mostly yellow. The characteristic of the Champlain marbles is their extreme hardness. They are equal in price with those in general use, and they are among the most beautiful in the world. The white has a soft yellow tinge much warmer than that in general use, and the various colours are equal to the best used in Florentine work. The use of yellows will relieve the monotone of the white without lessening the light and cleanliness. Bronze anchors and bolts will be used to secure the marble work.

Open fireplaces are provided throughout the building, each flue of which forms an extracting shaft of the best kind. There are also large shafts adjoining the boiler flue, which which will be connected to rooms, &c., by pipes horizontally.

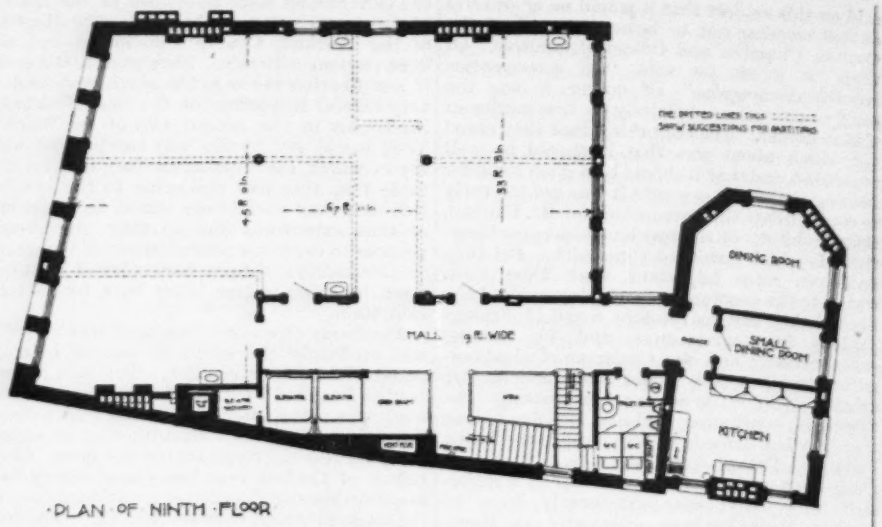
Arrangements can be made for cooling certain rooms in summer if desired.

Heating will be accomplished partly by indirect radiation in connexion with the ventilation, and partly by direct radiators.

The strength of the building will be of very high standard; the stone and granite recommended are both unusally strong. Actual experiment has shown that from 8,000 lb. to 14,000 lb per square inch are required to crush Kibbe stone, and the granite is of even higher power of resistance. The building has been designed to sustain a load of 200 lb. per square foot upon the floors, and any separate sections will be capable of a greater strain.

The walls are according to the building laws of the City of New York—in some parts are in excess of those provisions.

The cost of the building has been approximately estimated. While it may be influenced, for economy or otherwise, in the detail of finishings, the sum stipulated, viz., 400,000 dols., will give a fair substantial interpretation of this design according to the specifications."



The United States Trust Company's Building, New York.

SHEFFIELD MUNICIPAL BUILDINGS COMPETITION.

WE publish two more of the designs submitted in this competition, that by Mr. J. W. E. Tilley, of Belfast, and that by Mr. W. Henman, of Birmingham.

In regard to the first-named design, Mr. Tilley sends us the following remarks as to some of the points kept in view:—

"The suggestion that the basement floor might be considered a lower ground floor has been acted upon, and there is an entrance to it from Norfolk-street. It contains the health department, and some of the minor rooms of the Water and Borough Surveyors' departments, which were to be on the ground-floor.

It was thought desirable to have a direct entrance to the ground-floor from Surrey-street, in addition to the principal one in Pinstone-street, as by that arrangement the Accountant's general office would be well suited for a general rate office, for which, it is said, it will probably be used at some future time

As the plans show the general arrangement, it need only be said that the positions of the several departments agree with the "Instructions," and the rooms in the majority of cases are larger than the given minimum sizes; also, that all drawing offices have a north light.

The Council chamber has been placed in such a position as would secure quietness and good lighting, as well as a separate entrance for burgesses to the gallery, without their having to otherwise enter the building.

The reception and dining rooms and the Mayor's parlour are arranged en suite, and can be used as one room or divided into three, as desired.

As suggested, the office lavatories are grouped together on the lower, ground, and second floors; while the two public lavatories are on the lower ground floor, at the Cheney-row end of the Pinstone-street front.

The future extension of the building would be an additional story towards Cheney-row.

The building would be fireproof, the floors throughout being of steel decking. The fronts would be faced with some stone that has been proved to weather well in Sheffield, and the roofs slated.

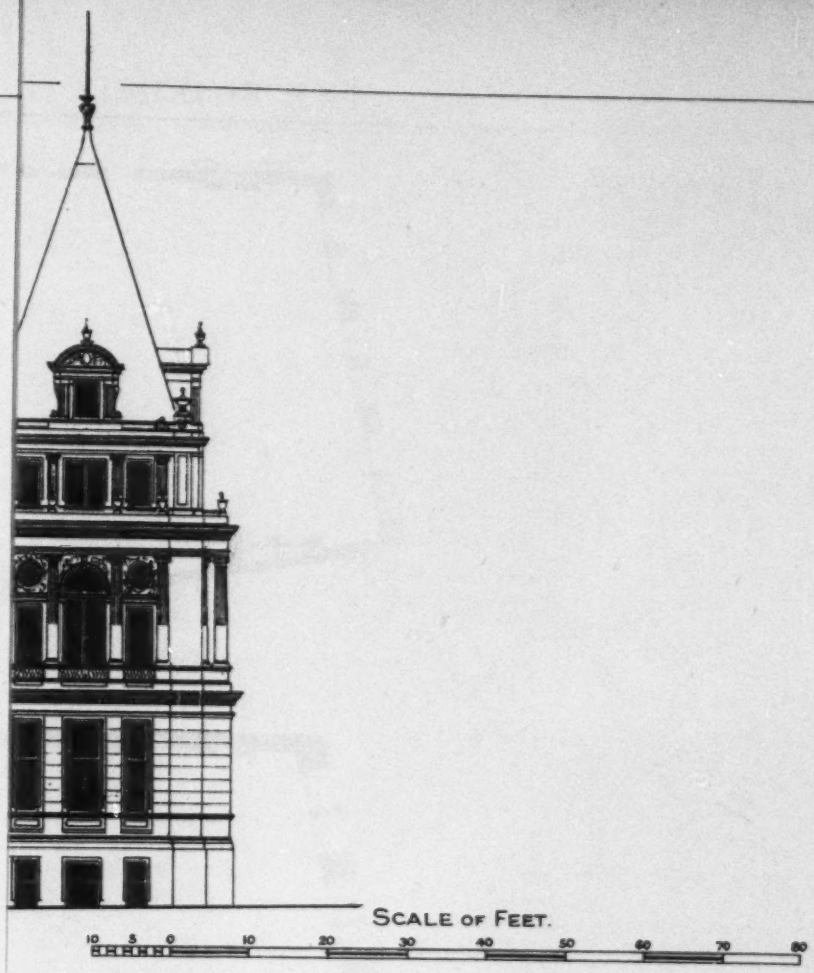
The heating would be by low-pressure steam, fresh air being drawn in at a turret at the corner of Surrey-street and Norfolk-street, and heated by steam-pipes in air-chambers under the different corridors before being discharged into the building, while outlet flues near the ceilings would remove the foul air. In addition to the above, radiators would be placed at the entrances, and near the windows in offices without fireplaces. The ventilation of the lavatories would be kept entirely distinct from that of the main building.

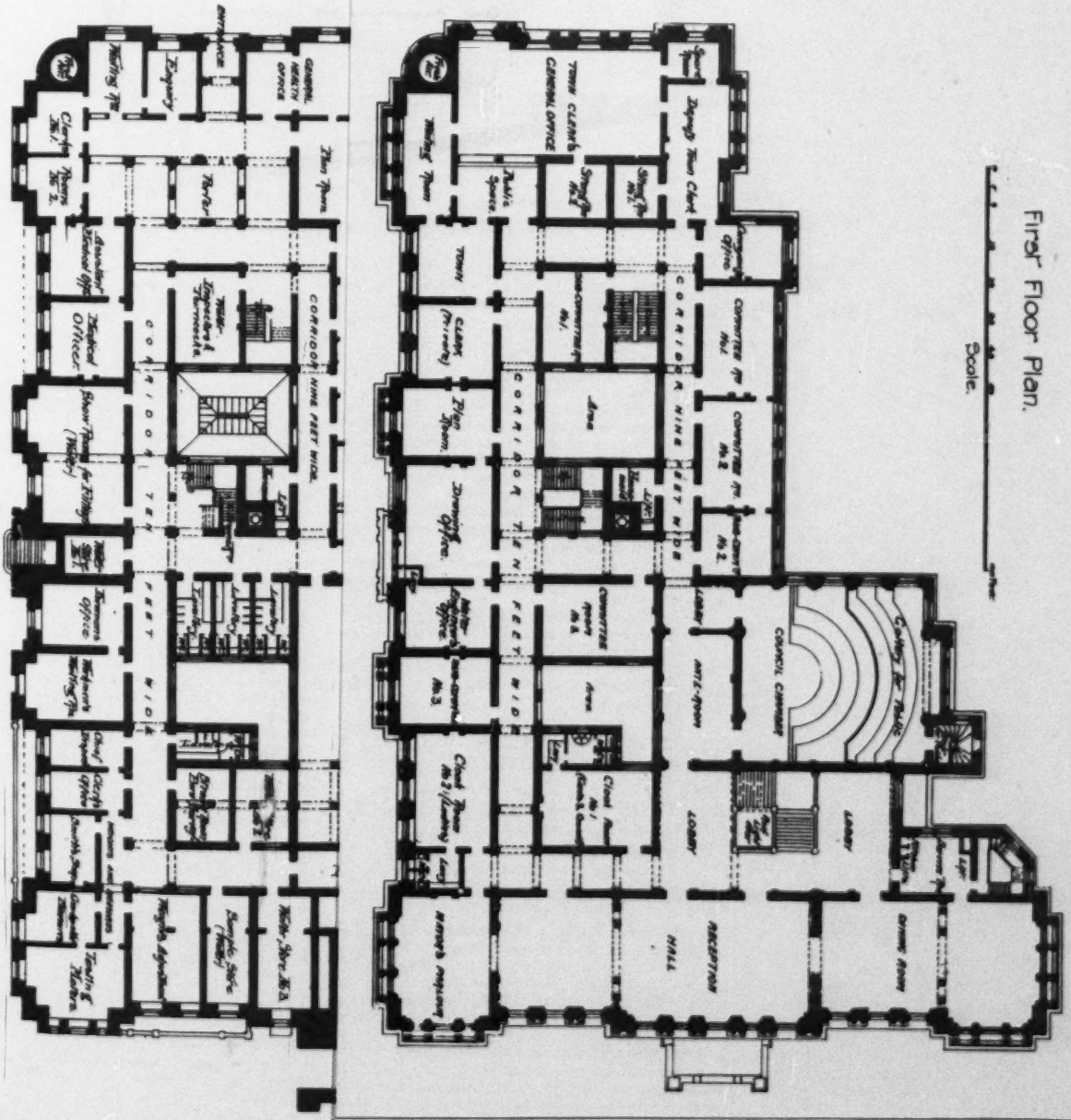
The lighting throughout would be by electricity, the boilers, engines, and dynamos being in an out-basement towards the Norfolk-street end of the building."

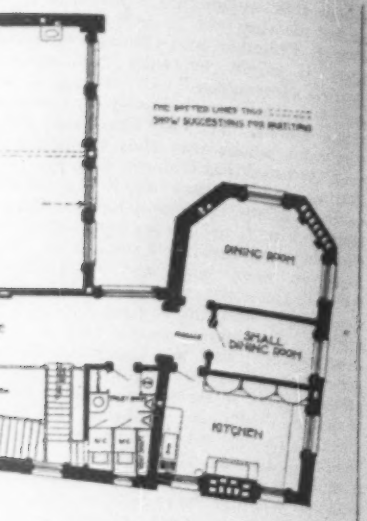
In regard to Mr. Henman's design we quote the following passages from his report which accompanied the drawings:—

"In the general arrangement of the plan adopted and the external design I have been influenced by the following, among other, important considerations, viz.,—

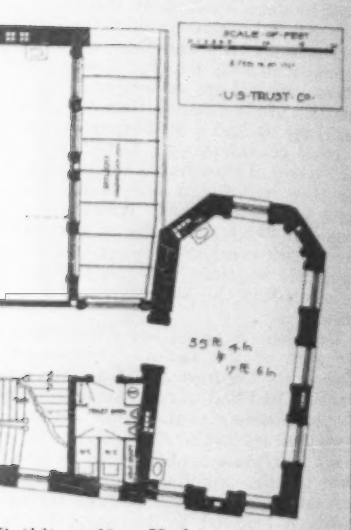
1. The convenient grouping of the offices, &c., in the separate departments.




First Floor Plan.
Scale.
CORRIDOR NINE FEET WIDE
COUNCIL CHAMBER
LOBBY
RECEPTION HALL
TOWN CLERK'S GENERAL OFFICE
COMMITTEE ROOM No. 1
COMMITTEE ROOM No. 2
COMMITTEE ROOM No. 3
PUBLIC OFFICE
TOWN CLERK (Private)
Plan Room
Drawing Office
Chief Clerk
Engineer's Office
Chief Clerk
Surveyor's Office
Chief Clerk
Medical Officer
Sanitary Inspector's Office
Chief Clerk
Water Engineer's Office
Chief Clerk
Waterworks Engineer
Chief Clerk
Engineer's Office
Chief Clerk
Borough Treasurer
Chief Clerk
Rate Collector
Chief Clerk
Rate Collector
Chief Clerk
Rate Collector



R. W. Gibson Architect New York



Building, New York.

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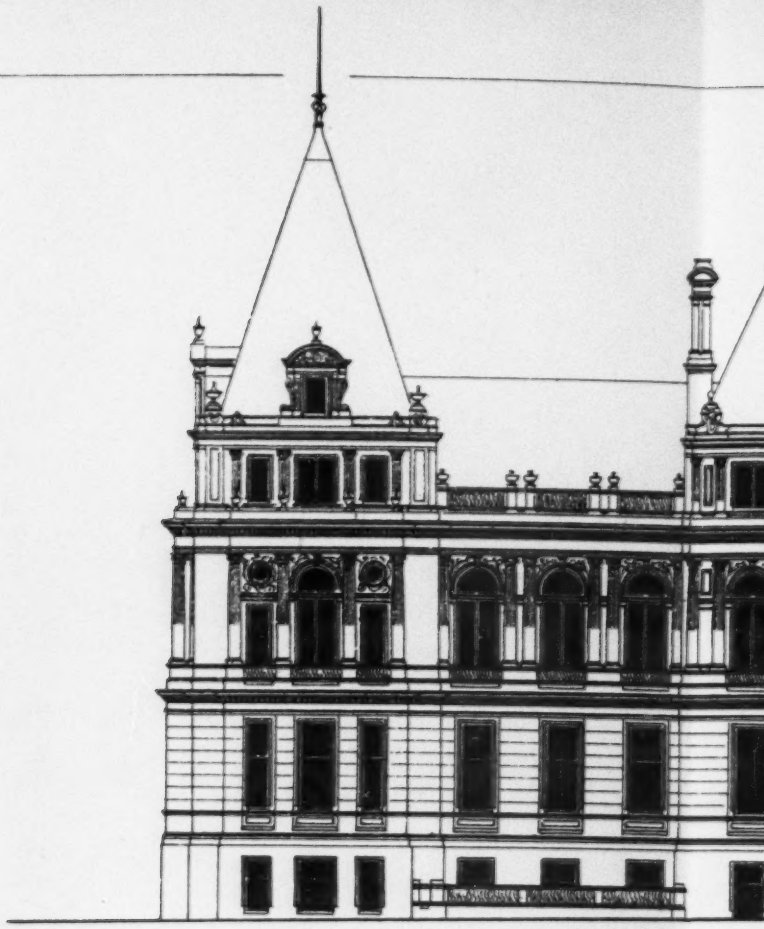
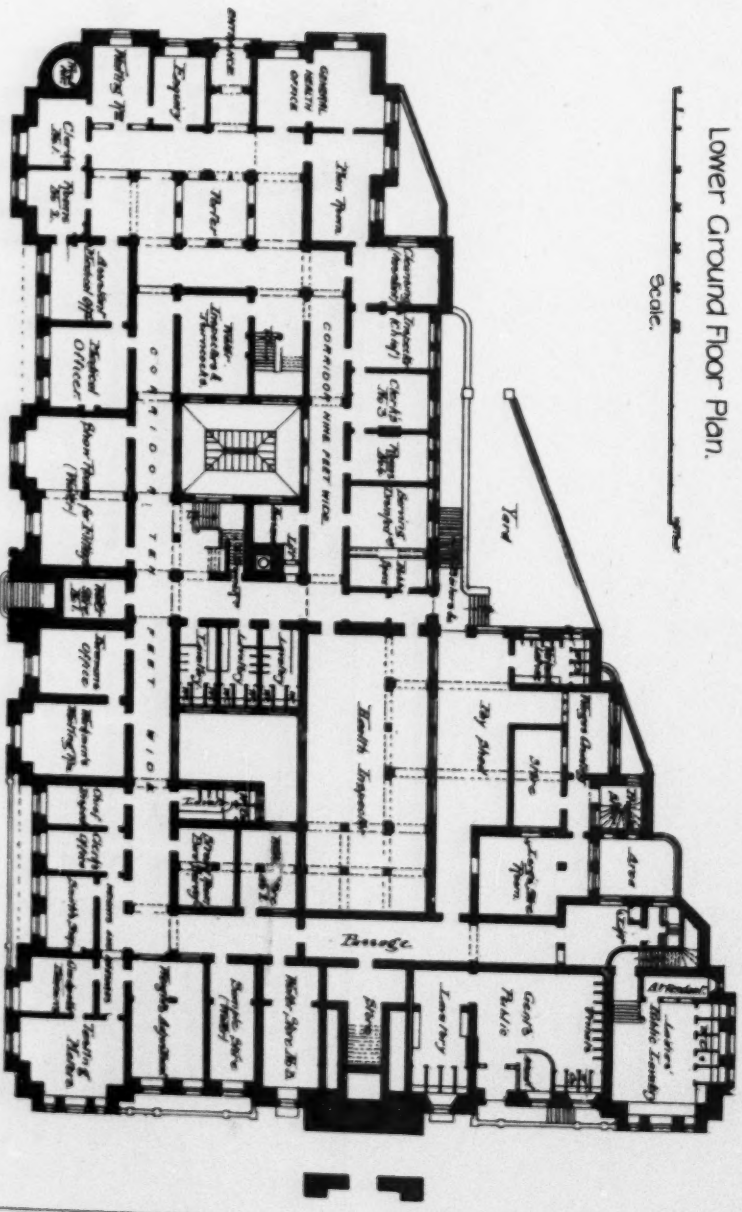
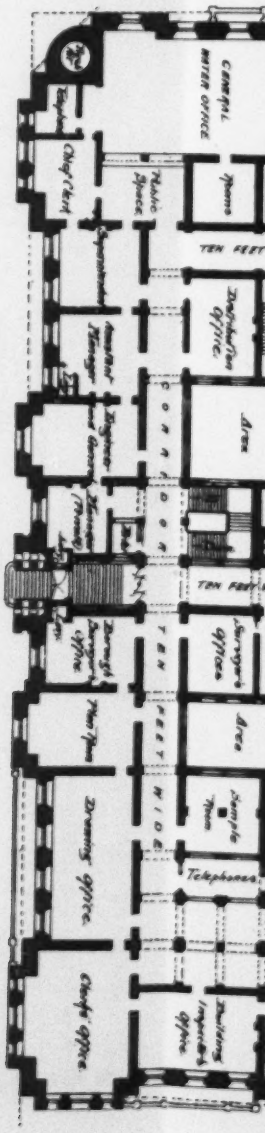
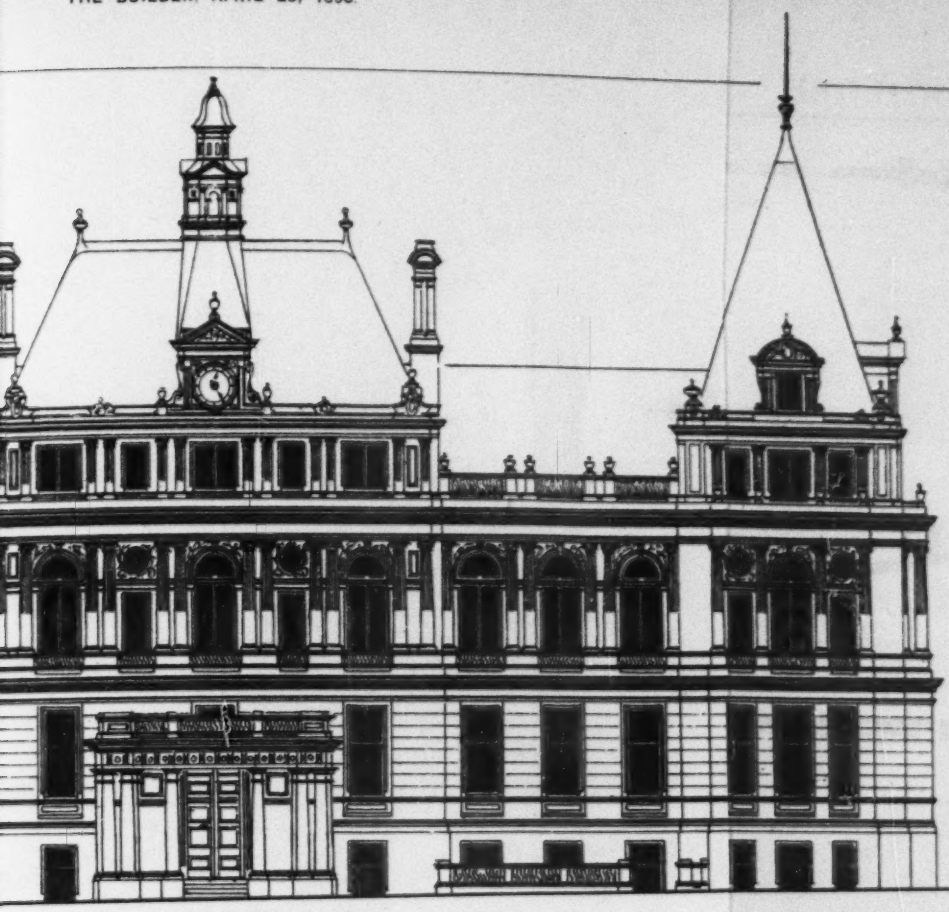


ELEVATION





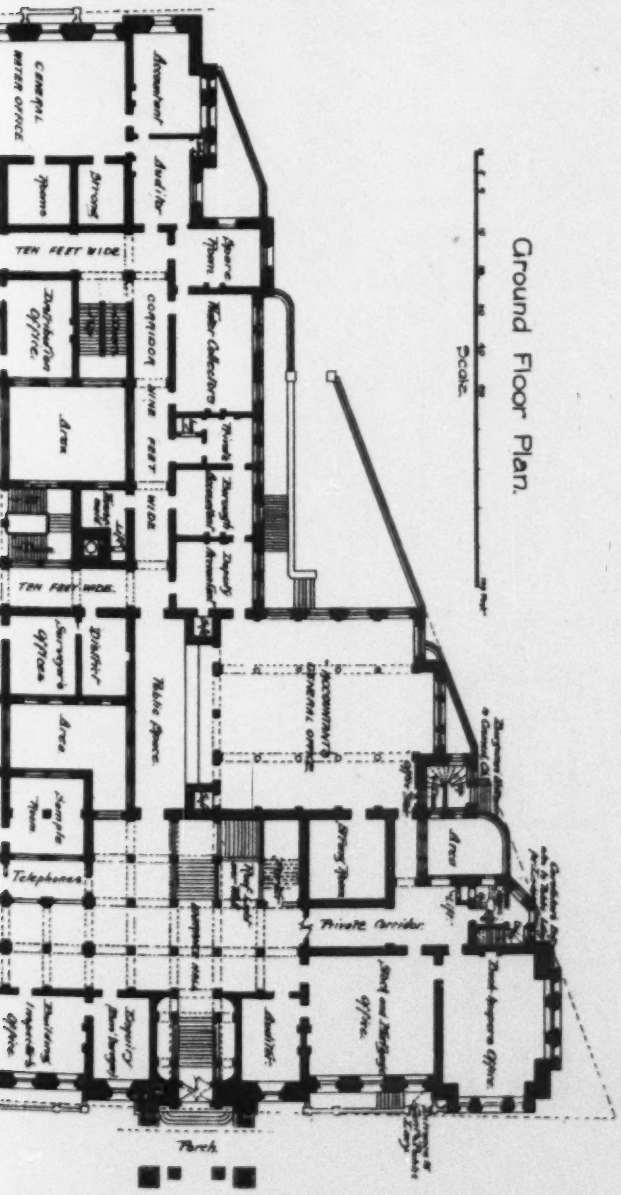
SHEFFIELD MUNICIPAL BUILDINGS



TION TO PINSTONE STREET.

SCALE OF FEET.

10 5 0 10 20 30 40 50 60 70 80



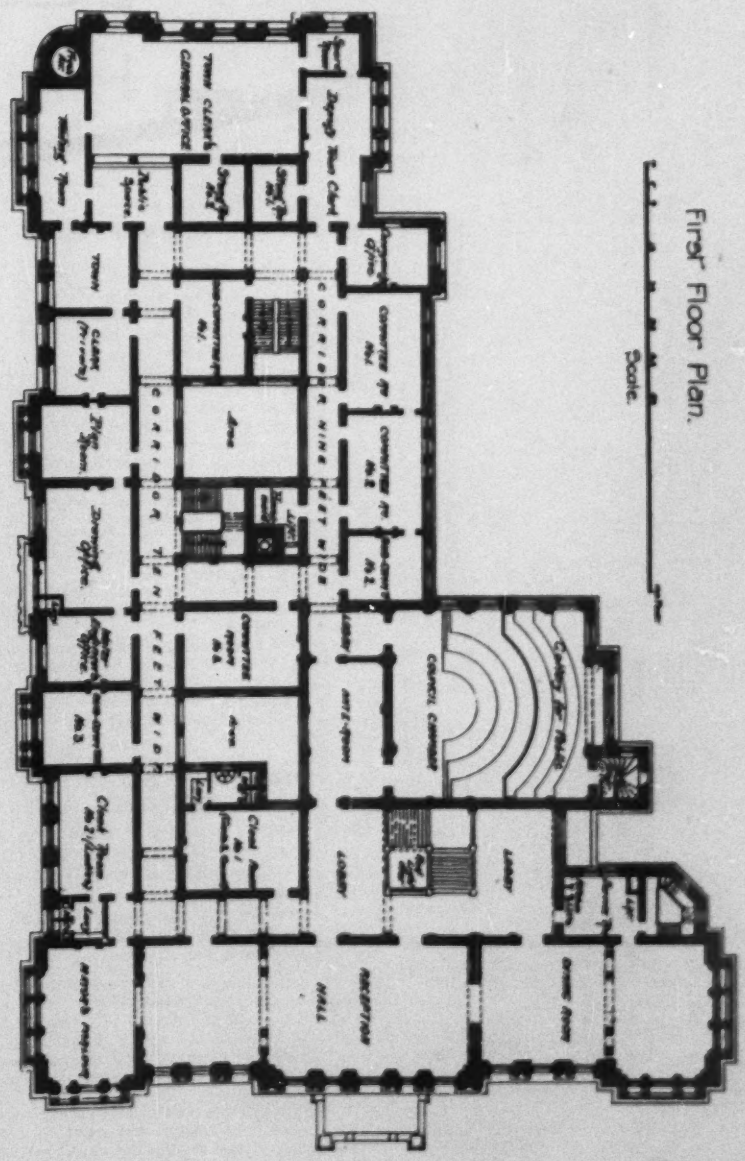


PHOTO-LITHO. SPRAGUE & CO. 52, MARTINS LANE, KINGSWAY, LONDON, W.C.

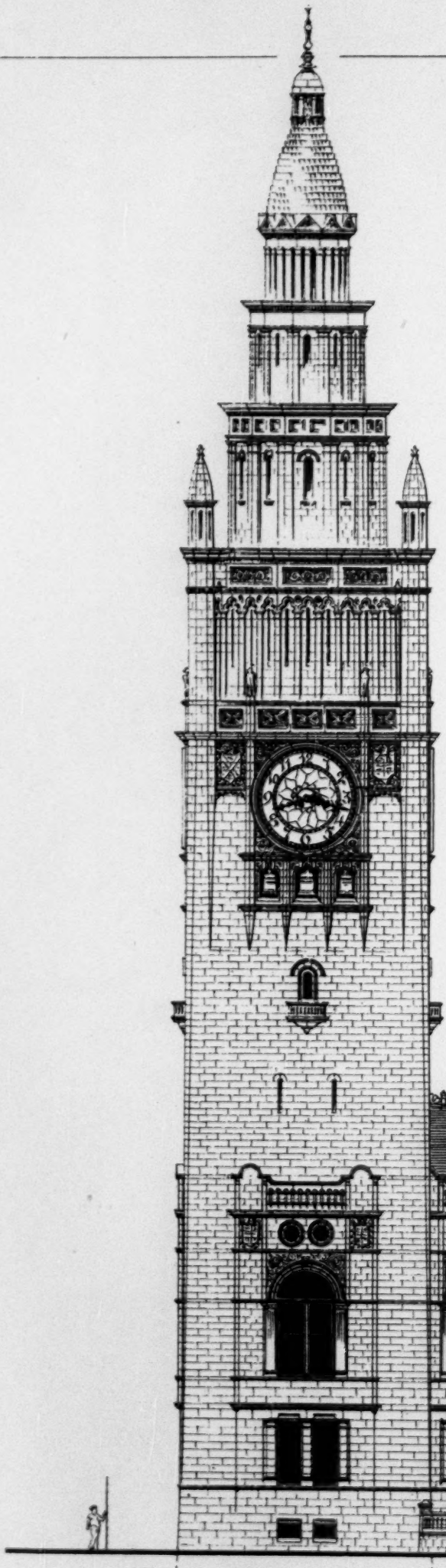
LDINGS COMPETITION.—DESIGN SUBMITTED BY MR. J. W. E. TILLEY, B.A.

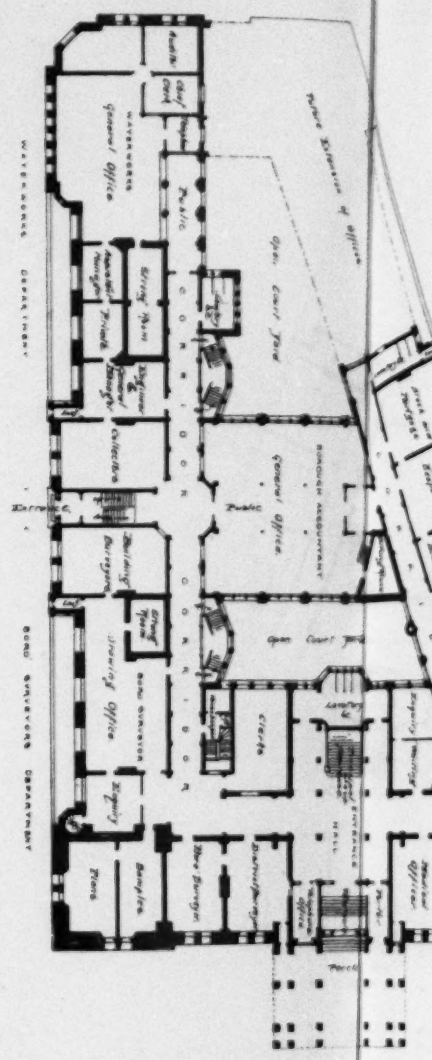
UNITED STATES TRUST COMPANY

The Phototype Co., 366, Strand, London.

UNITED STATES TRUST COMPANY'S BUILDING, WALL STREET, NEW YORK.

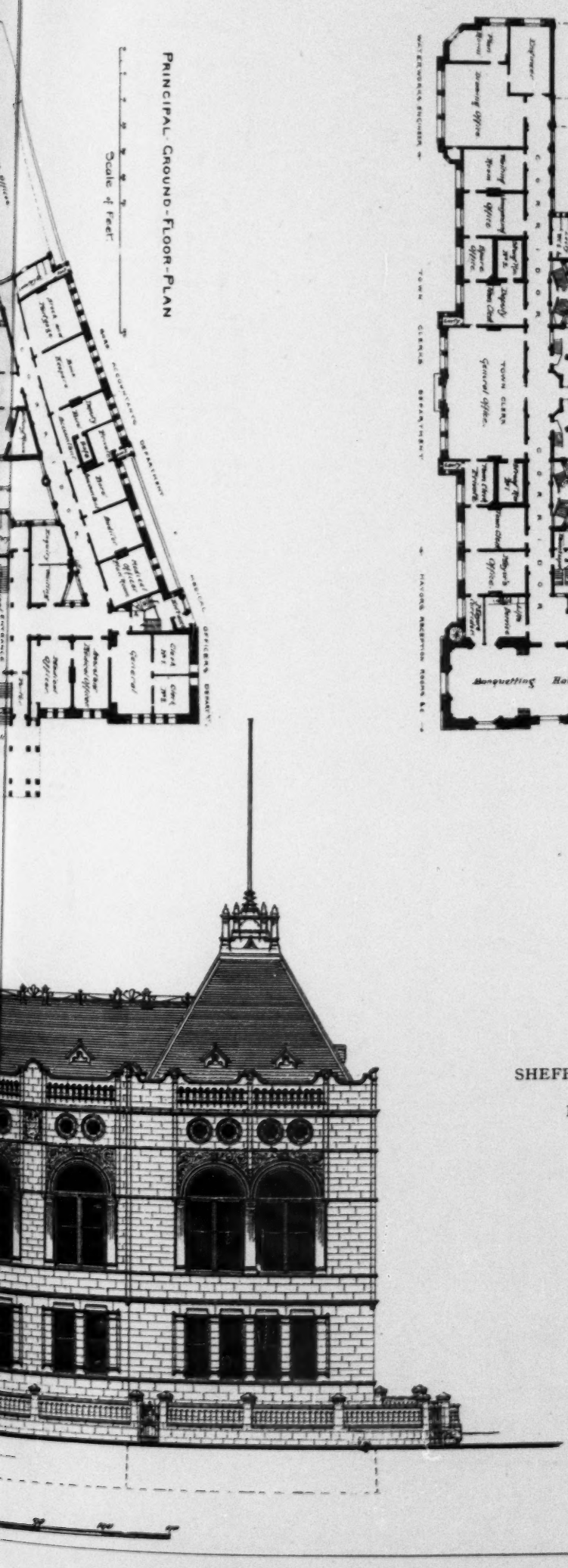
MR. R. W. GIBSON, ARCHITECT.





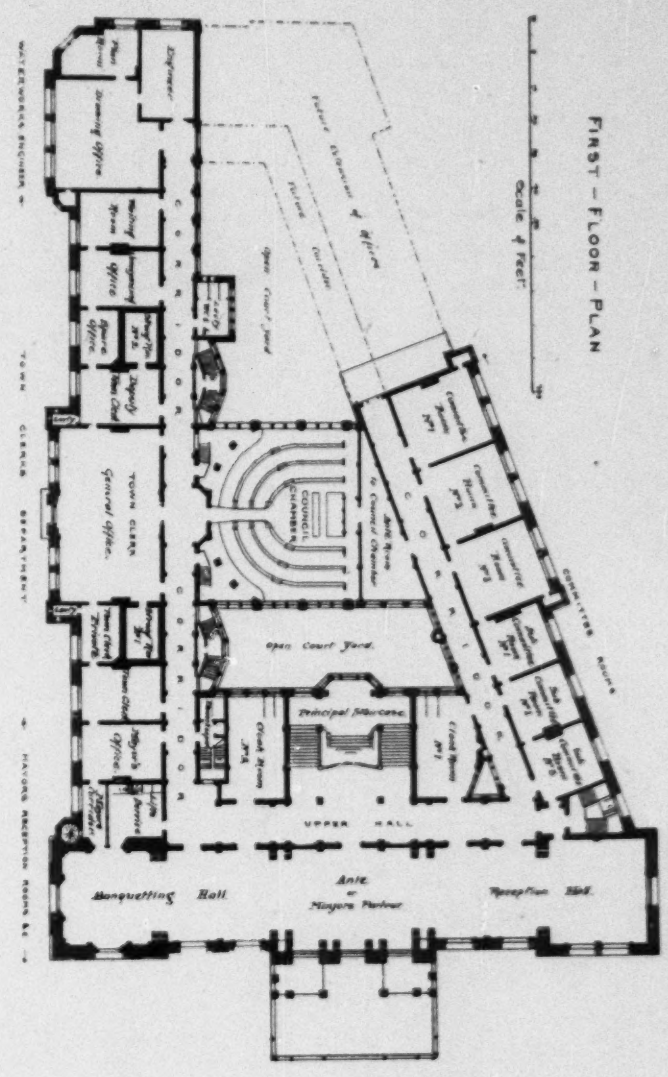
ELEVATION TOWARDS PINSTONE STREET.

SCALE - OF - FEET



PRINCIPAL GROUND-FLOOR PLAN

Scale of Feet



FIRST-FLOOR-PLAN

Scale of Feet

SHEFFIELD MUNICIPAL BUILDINGS COMPETITION.

DESIGN SUBMITTED BY MR. W. HENMAN, A.R.I.B.A.

PHOTO. THO. SPRAGUE & CO. 22, MARTINS LANE CANNON ST. LONDON, E.C.

"INK-PHOTO," SPRAGUE & Co., 22, MARTINS LANE, CANNON ST., LONDON, E.C.

"TURENNE ENFANT."—M. HERCULE, SCULPTOR.

"INK-PHOTO," SPRAGUE & Co., 82, MARTINS LANE, CANNON ST., LONDON, E.C.

"LULLY ENFANT."—M. GAUDEZ, SCULPTOR.

2. Convenient access between those departments by well-lighted corridors and easy staircases.

3. To give, as nearly as the requirements of practical construction admit, offices, &c., of the sizes specified in the 'Instructions,' and to place them on the floors indicated.

4. To arrange the several rooms of different sizes so as to give proportionate height without the introduction of mezzanine floors, which, in public offices, are of questionable convenience.

5. To utilise the fall in the ground so that towards the east end the lower floor becomes in reality the ground-floor.

6. To provide externally an effective predominating feature, which, while not clashing with adjacent buildings, will mark the edifice as being of an important municipal character.

To take the last consideration first, I am of opinion that the near proximity of the Tower of St. Paul's Church, with its dome-like termination, precludes the introduction of a dome as the principal feature of the new building as well as of a central tower; but, inasmuch as Surrey-street, Fargate, Leopold-street, and Barker-pool, all converge towards the north-west corner of the site, and that point on the principal front towards Pinstone-street is furthest from the church tower, indicate that there should be the main feature in the design.

Following up this argument, and in consideration of the loftiness of new buildings on the surrounding corners, it is evident that to give an imposing character to the Municipal Buildings such tower must be of ample dimensions, both in bulk and height.

As the smoky atmosphere of Sheffield gives a dinginess to buildings severely Classic in design, and the minute details of later Gothic and Renaissance styles are quickly marred thereby, I have adopted a free treatment, Romanesque in character, in order to secure the boldness of the former combined with the piquancy of the latter, which, however, can only be faintly indicated by the small-scale elevation.

Portions of each front are recessed to secure a play of shadow and variety, as well as good light to the lowest floor.

Lighting.—Particular care has been exercised in order to secure the perfect lighting of all rooms, corridors, staircases, &c.; the windows are numerous and of ample dimensions. It is intended that gas be laid on throughout as required, but there is an abundance of space on the lowest floor for the erection of electric-lighting plant.

Heating.—Space for boilers in a central position is provided *below* the lower ground floor, so that all the principal rooms, offices, corridors, &c., may be warmed by hot water, open fireplaces being provided for use in the private offices, &c.

Ventilation.—It is proposed that proper ventilation shall be effected by a system of propulsion, fresh air being drawn from a suitable source, cleansed, warmed in cold weather, and forced by means of a Blackham fan-wheel through channels along the corridors, with suitable openings into the several rooms, exhaust-shafts being provided for the exit of vitiated air.

Materials.—Externally, all the street-frontages and that towards the churchyard to be faced with well-selected stone of good colour, granite bases being supplied for the columns to principal entrance-porch. Around the inner courtyards facings of cream-coloured bricks with stone dressings will be employed. Internally, except to the entrance-hall and grand staircase, which will be part stone and marble, the walls, ceilings, &c., are intended to be finished in plaster. The floors to be of fireproof construction, laid with encaustic tiles or mosaic to the halls, corridors, &c.; boarded to the rooms, offices, &c.; in oak to the principal apartments, with parquet borders."

SCULPTURE: "TURENNE ENFANT" AND "LULLY ENFANT."

THESE two statues, both of which have been purchased by the Municipality of Paris, are pleasing examples of a kind of ideal portrait sculpture to which French sculptors have rather taken of late years, viz.: the representation of the boyhood of eminent men.

The statue of Turenne was in the Salon of 1888; the sculptor, M. Hercule, was a pupil of Jouffroy, and some years since executed a work entitled "Primevère" which attracted much notice and was purchased by the Corporation and executed in marble and is now in the museum at Auteuil. The "Turenne" will probably be either erected in some public site in Paris, or also placed in an Art Museum.

The figure of Lully the musician, who filled a considerable place in the early development of modern instrumental music, is by M. Gaudez. The figure is in bronze, and is to ornament one of the squares or public gardens of Paris.

Appointment.—Mr. C. J. Dawson, F.R.I.B.A., of Barking, has been appointed architect to the newly-formed School Board for Barking, Essex.

COMPETITIONS.

Proposed Municipal Buildings, South Shields.—On Monday, the 21st inst., a meeting of a committee of the South Shields Town Council was held at the Marine Board Offices, Mill Dam, to receive the report of Mr. G. G. Hoskins, F.R.I.B.A., the assessor appointed to make a selection from the thirty-three sets of competition drawings sent in for this building. The scheme is estimated to cost 10,000*l.* The three sets selected by Mr. Hoskins in order of merit are those bearing the following mottoes:—(1) "Constable;" (2) "Ad Rem.;" (3) "Magistrate." Mr. Hoskins's report having been unanimously adopted, the sealed envelopes were opened, when the names of the successful competitors were found to stand as follows:—(1) Messrs. Perkin & Bulmer, of Leeds; (2) Messrs. Clarke & Moscrop, of Darlington: (3) Mr. J. H. Morton, of South Shields.

Yardley Board Schools.—We are officially informed that, acting on the advice of Mr. William Henman, A.R.I.B.A., of Birmingham, who was appointed the assessor in this (limited) competition for schools at Red Hill, Coventry-road, for 1,000 children, the Board has selected the design of Messrs. Crouch and Butler for execution, and awarded a premium of 15*l.* to Mr. W. N. Gething and one of 10*l.* to Mr. F. J. Yates. Six sets of designs were received.

ARCHITECTURAL SOCIETIES.

Cardiff Architects' Society.—The architects of Cardiff held a meeting on the 16th inst., and adopted rules drafted by a committee appointed for the purpose at a previous meeting held on March 12, when it was resolved to form the Cardiff Architects' Society, for the advancement of the profession of architecture, and the consideration of questions of professional practice. The architects in practice in Cardiff number about thirty, and the Society will, it is believed, include all these as members, in addition to many others in the surrounding district. The Hon. Secretary is Mr. F. Baldwin, of Church-street, Cardiff.

Edinburgh Architectural Association.—On Saturday, the members of this Association, under the leadership of Mr. David Macgibbon, visited that relic of the younger branch of the Douglases, Tantallon Castle. On arriving, attention was drawn to the immense size and strength of the wall of enceinte, with its central keep and gateway, and to the method which James V. had adopted to render the walls fit to resist artillery. The remains of the outer ditches and of the earthworks, which had probably been thrown up during some of the sieges of the castle, were also examined. The operations recently executed by Sir Walter Dalrymple were then pointed out. By these a great deal of the rubbish which had accumulated in the ruins has been removed, and safe access has been provided to various portions of the structure formerly inaccessible. Particularly, the stairs leading to the battlements of the great wall of enceinte have been restored, and the party were enabled to mount to the top and enjoy the fine prospect obtained from there. The defensive arrangements of the battlements and the central tower were noticed, and also some round shot of iron, 6 in. in diameter, which have probably survived since the siege by Cromwell. The large hall and other buildings remaining of those which formerly surrounded the courtyard were commented on as indicative of the work of a late period. Tantallon was originally a Royal castle. In 1377 Alan de Lauder was constable. Like Doune Castle, it belonged to and was possibly rebuilt by Murdoch, Duke of Albany. In 1479 it passed into the hands of the Earls of Angus, with whom it remained till taken by the Covenanters in 1639, and was afterwards destroyed by Cromwell.—*Scotsman.*

The Albany Club at Kingston-on-Thames, occupying the fine old mansion of the late Sir Charles Freake, recently known as "Bank Grove," was formally opened on the 12th inst. It is delightfully situated on the banks of the Thames, with a frontage of 420 ft., overlooking one of the most charming parts of the river. The club-house contains commodious dining and drawing-rooms, library, morning, billiard, smoking, and card-rooms, and the whole have been furnished by Messrs. Oetzmann.

"GOTHIC ARCHITECTURE."

SIR,—The notice of my book, "Development and Character of Gothic Architecture," published in your issue of March 15, seems to me somewhat unfair; and I trust you will allow me space to offer to your readers the following remarks in reply to a few of its statements:—

I have not, I believe, as you imply, written from prejudice, or with a desire to detract anything from the true merits of the Pointed architecture of England—an architecture which few Englishmen, I suppose, appreciate better than I do—and I am not conscious of having had a wish to establish any ill-founded or fanciful theory. On the contrary, certain marked characteristics of French Gothic architecture had, in the course of my study of it, forced themselves upon my attention as fundamentally distinguishing this architecture from all others. Whichever style one may prefer, every intelligent student must, I think, sooner or later reach the conclusion that the French and the English styles are radically different both in structural organisation and in artistic character. And since the distinctive qualities of the French Gothic result from the logical carrying out of a certain set of architectural principles, and since also this cannot be said of any other Pointed architecture, it has seemed to me that confusion might be avoided by confining the term "Gothic" to this developed French work; while, as I say in my preface, the general term *pointed architecture* might be used to designate the various styles of other countries. These latter styles are, as I try to show, essentially but decorative modifications of the Romanesque. The Gothic idea was never fully or consistently carried out in them.

Two important considerations, it is said, I seem to have overlooked, namely: (1) That "it does not always follow that the most complete carrying out of a system to its logical conclusions produces the most satisfactory artistic results;" and it is questioned "whether the system of reducing the piers to the smallest possible area and propping everything with a scaffolding of flying buttresses, which has been carried out so completely in many typical French cathedrals, is really consistent with the aims and the highest expression of architecture; . . . . it is a questionable credit to French Gothic to have carried out a system . . . . at the expense of monumental mass and solidity of expression;" and (2) "the importance of mouldings and ornamental details in characterising style." I believe that I may assert that I have overlooked neither of these considerations. In regard to the first, there was no occasion to speak in the book; for typical French cathedrals of the true Gothic period never exhibit any extreme reduction of piers, &c. It appears to have always been recognised by the builders of the best time, that the exigencies of the eye must be regarded as well as other exigencies. A strictly monumental and dignified aspect is preeminently characteristic of typical French Gothic. In the declining style we do indeed meet with instances of the extreme carrying out of the principles of the system. And in the Church of St. Urbain of Troyes, for example, the monumental aspect of the building is seriously impaired thereby. But it did not fall within the scope of my book to treat of the declining style. As to the importance of mouldings and ornamental details in characterising style, I supposed that I had duly recognised it in giving separate chapters to their consideration—besides including them in my general introductory definition. But I have endeavoured to show that these have but a secondary importance, as, in fact, you admit where you say: "It is true that this consistency of construction and of constructive expression is the *most important* element in style."

But the chief misrepresentation, which even inadvertence can hardly excuse, is that which occurs where the reviewer says: "It must be observed also that while Mr. Moore is never tired of picking out the logical defects of English architecture, he appears completely blind to defects of logical design in French architecture. He quotes (in illustrations) a bay of the Cathedral of Senlis as showing how the ground plan was laid out and the sections of the piers determined by the intended plan of the vaulting, entirely ignoring the fact of the intermediate circular pier having no suggestion on plan of the transverse groins of the sexpartite vaulting, or the fact of the vaulting shaft for this beginning over again, with a new base of its own, from the abacus of the ground-story cylindrical pier. This system of placing little bases for the vaulting shafts on the abacus of the lower piers, which was more used in early French Gothic than anywhere else, is in fact one of the most illogical and distinctly un-Gothic features in early Gothic architecture; it entirely breaks the connection between the vaulting and the ground-story, and very materially weakens the homogeneous character of the design; yet this the author passes over without reprobation, and even in silence, because it is a French defect." It is true that I did not criticise the circular ground-story pier in this place, but a little further on (p. 61), when I come to treat of the development of the typical Gothic pier, I say, referring to similar circular piers of Laon and Paris: "These round columns were soon felt to be

unsatisfactory, as affording no independent supports for the various members of the superstructure. Such columns did not partake of the new principles that now characterised every other constructive member of the building. Attempts to improve them were therefore made, and a new and strictly functional form was soon devised, a very early, perhaps the first, example of which may be studied in the nave of the Cathedral of Paris." It is, therefore, far from correct to say that I pass this matter over in silence because it is a French defect.

The reviewer accuses me of "picking out, in various matters of detail, undoubted weaknesses of English Gothic and representing them as typical." To this I may remark that in no way could I have more effectually weakened my argument, and exposed myself to merited blame, than by having done so. I have, however, a hope that unbiassed readers will see that I have fairly set forth the leading characteristics of pointed buildings in England. If I have not done this, let it, by all means, be shown.

On what you call "the author's blindness to English characteristics," concerning which "it is sufficient to note that he has not a word to say about so graceful and characteristic an invention as fan-vaulting," I need only observe that this invention was posterior to the epoch of which my book treats, and that special reference to it was, therefore, uncalled for. Had the index been consulted, it would have been found, however, that incidental mention of fan-vaulting occurs on p. 144.

CHARLES HERBERT MOORE.

Cambridge, Mass., April 10, 1890.

*** Writers who are prejudiced never *are* aware of the fact, or it would not be "prejudice," but something else. Mr. Moore's reply is quite beside the real point of our criticism. The main defect of his logic lies in taking a particular plan of building, with three aisles and a *chevet* termination, and defining that as "Gothic." We pointed out that he might just as well take the plan of the Parthenon as representing Greek architecture, and say the Erechtheion was not Greek architecture. As to the question of his "passing over in silence" a certain feature because it was a French defect, our statement was strictly correct in regard to the illustrations we were speaking of. The author gives illustrations (pages 45 and 47) with the intermediate pier circular on plan and with a vaulting shaft illogically placed on the capital of the pier (or rather column), and says, "it will be seen that the architect not only intended from the first to vault this choir, but that he perfectly understood what the form and constructiou of the vaulting was to be; that he had in fact settled in advance his scheme for the vaulting in every detail": while the very illustration employed *shows the contrary*, and shows an illogical treatment which, as we said before, we are quite certain the author would not have passed over if the illustration had been taken from English Gothic. As to fan-vaulting, the index *was* searched with that precise object, and what we found was the following sentence: "this peculiarity marks an early step in the direction of the so-called fan-vaulting system which subsequently became so conspicuous a feature of English pointed design." That remark, without any illustrations, is the whole reference to fan-vaulting in the book. As to the general question of Mr. Moore's fairness in his representation of English Gothic we may give the reader an illustration by reproducing the accompanying sketch of an Early English capital which Mr. Moore has the assurance to present to the reader as a typical form of the Early English capital. This kind of thing leaves only one of two conclusions possible: either Mr. Moore is ignorant of the details of the English Gothic at which he scoffs, or he is deliberately misleading his American readers (who may possibly know no better) to subserve his own argument. His book, in spite of a great deal of ability displayed in it, is one-sided, dogmatic, and misleading, and an entirely unsafe guide to the study of Gothic architecture: it is a piece of advocacy to subserve a captious theory. —ED.

Early English capital as illustrated (!) by Mr. Moore for the information of American students.

DAMAGE TO GAS-PIPES BY STEAM-ROLLERS.

SIR,—In reply to "A Borough Engineer," whose letter on the above subject appears in the last issue of the *Builder*, I think the case he has in his mind is that of The Gas-light and Coke Company *v.* Vestry of St. George's, Hanover-square, which came before the Queen's Bench Division of the High Court of Justice in December, 1887, and in which the company were successful in restraining the vestry from using steam-rollers of such weight as to damage their pipes. I am afraid, however, that this case will not assist him in resisting the claim of the Gas Corporation (or is it a company?) in question, if they have fulfilled the condition precedent to making such claim—namely, laid their mains in a proper manner. As far as my recollection serves me, this was the whole question in the case cited above. The Company's mains were laid so as to resist "legitimate pressure" from the surface; they were submitted to unusual—*i.e.*, illegitimate—pressure by the use of a steam-roller; and the users of the roller were told in plain language not to do it again at their peril. I know of two instances in which local authorities have recognised their liabilities in cases of damaged mains, and have settled with the companies rather than let the matter go into court.

With regard to the question of liability, a learned Judge once said that any one who took into a public thoroughfare an element of danger,—for, instance, a bear,—did so at his own risk, and consequently he was responsible for any damage resulting from his act. Gas companies have the use of the subsoil of the public ways, and they convey beneath it an element of danger,—a "bear," but properly chained and muzzled in service-mains, "well-made and properly laid," to use the words so frequently repeated in the Gas-light and Coke Company's case. The local authorities, as the parties responsible for the proper condition of the roads, also take into the streets an element of danger in the shape of a heavy steam-roller,—a "bear" of another kind. Now, does the passage of this roller over the street subject the pipes beneath to legitimate or illegitimate pressure? That is the whole question, as it seems to me. If in the "Borough Engineer's" case he can show that the pipes were laid too near the surface, or upon improper soil, loosely thrown in so as to allow subsidence with little pressure from above, it would appear that he would be in a position to resist a gas company's claim for damages. If, on the other hand, the pipes were "well made and properly laid" to resist ordinary pressure, I think their claim will be upheld, if the matter is taken into Court.

X. Q. S.

London, April 19, 1890.

The Student's Column.

ELECTRICITY, MAGNETISM, AND ELECTRICITY SUPPLY.—XVII.

SHUNT-WOUND DYNAMO-MACHINE (*continued*).

THE characteristic curve for a shunt-wound dynamo may be constructed by methods similar to those employed for the separately excited and series machines.

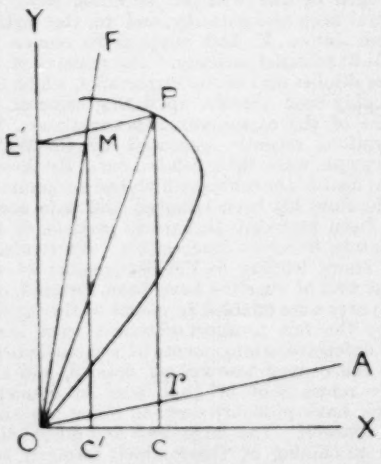


Fig. 45.

The diagram (fig. 45) is, however, a little more complicated from the fact that, whereas in the two former cases the whole of the armature-current flows into the external circuit, in the present case a part of it is diverted through the field magnet coils, and the proportion of the field-current to the armature-current varies as the external circuit is altered.

Let O A be the line for the resistance of the armature; O F that for the field magnet coils. If the armature is producing a current represented by O C, P C is the E.M.F. set up in it. But a part of this electro-motive force, viz., P C, is absorbed in the armature itself, so that Pp is the E.M.F., or difference of potential, between the terminals of the machine, and it is this E.M.F. which drives the exciting current round the field magnets. Draw P E' parallel to O A, then O E' = Pp, and if E' M is drawn parallel to O X, E' M represents the current in the field magnet coils; O C' is the projection of this line on to O X, and the balance of current, C' C, is that available for use in the external circuit.

If the line O P is drawn, then tan P O C, or $\frac{P C}{C O}$ is the total resistance in circuit, and $\frac{P p}{C O}$ is the resistance of the circuit external to the armature; it must, however, be pointed out that this circuit consists of the field-magnet coils and external circuit proper, placed abreast.

Many interesting comparisons may be made between series and shunt-wound machines. A shunt machine, *open circuited*, becomes simply a series machine, whose field-magnet coils have an abnormally high resistance, *short circuited*. A series machine open circuited can produce no effect because no current can flow round its field-magnets; similarly, if a shunt machine is short circuited it can be seen, from fig. 45 or by looking at the connexions in fig. 44, that it can produce no effect for the same reason; hence, a shunt machine *short circuited*, and a series machine *open circuited*, are in practically the same condition.

If the line O P turns about O towards O X it ultimately becomes a tangent to the curve at O, and the machine ceases to work; in the shunt-wound machine, therefore, there is also a critical resistance, but one *below* which no current is produced.

When a machine is always required, as frequently happens in the case of small dynamos, to send a certain current through a constant resistance, the type of machine used is of little importance. The point P on the curve never moves, so that the shape of the curve, which reveals the peculiarities of the particular machine, is a matter of no consequence. With larger machines, however, the load will generally, under ordinary working conditions, alter from time to time, and the current which flows between its terminals will probably be used for many independent pieces of plant or apparatus, through which current can be made to flow at will.

If, for example, the external circuit consists of a number of large electric lamps, placed in series, a lamp would be turned off by short-circuiting it, that is, by providing a by-path of no resistance for the current to pass on to the remainder of the lamps as before; although the act of turning off a lamp reduces the resistance of the circuit, the value of the current flowing from the machine must not change. The machine must, therefore, give a constant external current, irrespective of the resistance of the circuit, which will vary from its maximum value, when all the lamps are turned on, down to nil when all the lamps are off, in which latter case the machine will be practically short-circuited.

The smaller electric lamps are usually placed abreast; when a lamp is turned off, the current through it is stopped by open circuiting it, and the current from the machine correspondingly decreased; but this must not alter the difference of potential between the terminals of the machine, or the remaining lamps will be affected. In this case the machine must, therefore, give a constant external electromotive force, irrespective of the resistance of the circuit, and, consequently, of the current flowing, which will vary from its maximum value, when all the lamps are turned on, down to nil when all the lamps are off, the machine being then open-circuited.

A glance at the three characteristics already drawn (figs. 39, 43, and 45) will show that none of the machines hitherto described could fulfil the requirements of either of the above cases. The external characteristic of a constant-current machine is a line parallel to O Y, of a constant potential machine a line parallel to O X.

The output from the armature of a machine may be controlled by altering (1) the speed, (2) the position of the brushes, (3) the magnetisation of the field magnets.

If the motive-power is a steam-engine it may be fitted with an electric governor, which can be made to work over almost any range, but a considerable change of speed constantly taking place is open to objection, though, as a supplementary means of obtaining more perfect regulation, it is of great value. Shifting the diameter of commutation is at best but a clumsy device, and, with a machine of no great size, the sparks produced at the commutator are so mischievous that special measures have to be adopted for extinguishing them. The third method possesses distinct advantages over all others, and, in some form or other, has long

been used for regulating electricity supply from dynamo-machines.

If a shunt of variable resistance be attached to the field magnet coils of a series-wound machine (fig. 40), or if a variable resistance be put in series with the field magnet coils of a shunt-wound machine (fig. 44), the necessary excitation of the field magnets can be controlled by hand, or by some suitable electro-magnetic device. The same end, however, can now be attained without involving the use of a variable resistance, or, indeed, any special apparatus at all, by what is known as compound-winding the field magnets of a machine.

COMPOUND-WOUND DYNAMO-MACHINE.

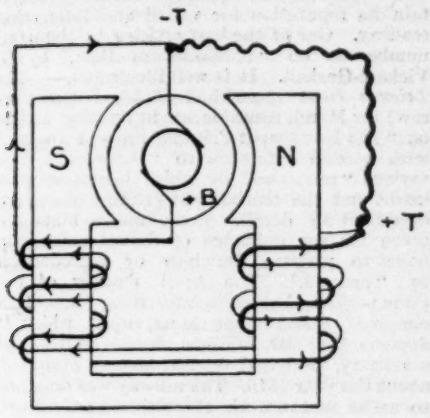


Fig. 46.

Fig. 46 shows the connexions in one method of compounding. The current comes from the armature through the positive brush + B, and is led a few times round the limbs of the field magnets, emerging from the machine at the positive terminal +T. From +T a sufficient quantity of finer wire is coiled round the magnets, and the other end attached to the negative terminal −T. If fig. 46 is compared with figs. 40 and 45, it will be seen that the compound-wound machine may be regarded as a combination of an ordinary series and shunt machine.

Continuous current dynamo-machines are most frequently compounded for giving a constant external electro-motive force or difference of potential between + T and − T (fig. 46); we shall therefore consider how this may be accomplished; indeed, it must be shown that a machine such as that shown in fig. 46 is capable of maintaining a constant E.M.F. in the external circuit. It is important to note that if the difference of potential between + T and − T (fig. 46) is constant, the current through the shunt will be constant too, the machine will therefore be, from an electrical point of view, a combination of a separately excited and series dynamo-machine, rather than of a shunt and series machine as the connexions seem to indicate. The constructions will be the reverse of that hitherto adopted, for we shall first draw the desired characteristic, and then determine what winding of the field-magnets will produce it.

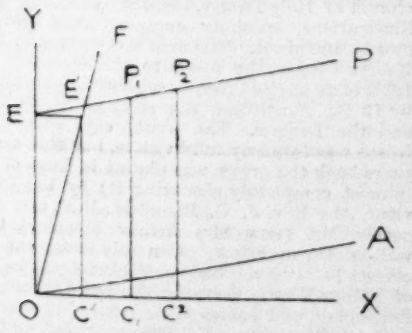


Fig. 47.

Set off O E, fig. 47, equal to the external E.M.F. required, then the characteristic will lie in a line E P drawn parallel to O A, the resistance line for the armature and the winding on the fields in series with it. Draw O F the resistance line for the shunt winding, and as in the case of the simple shunt-machine, find the current O C′ which flows through them. Take two points, P_1 and P_2 on the characteristic and draw P C and $P_2 C_2$ parallel to O Y.

On O Y (fig. 48) set off the lengths O S′, O S_1, O S_2 proportional to O C′, O C_1, O C_2 (fig. 47) respectively, so as to represent on a suitable scale the magnetising effect of the armature

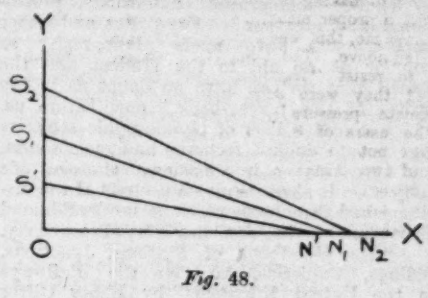


Fig. 48.

currents on field. Along O X set off on the same scale O N′, O N_1, O N_2 to represent the resultant field in each case, and proportional to C′ E′, $C_1 P_1$, $C_2 P_2$ respectively; S′ N′, $S_1 N_1$, $S_2 N_2$ are respectively the fields which the field magnets must produce in each case (compare

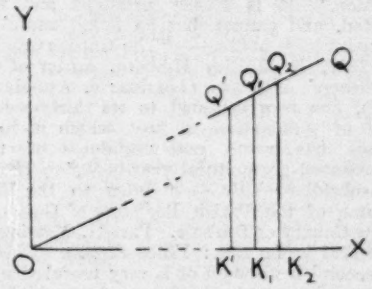


Fig. 49.

fig. 48 with figs. 38 and 42). If O Q, fig. 49, is the curve for the flux through the field magnets, lay off K′ Q′, $K_1 Q_1$, $K_2 Q_2$ proportional to the lengths N′ S′, $N_1 S_1$, $N_2 S_2$ respectively, fig. 48, then O K′, O K_1, O K_2 are the numbers of ampere turns required on the field magnets to produce the necessary field. Unfortunately the figures are too small to show how far the obviously-desired condition K′ K_1 : K_1 K_2 = C′ C_1 : C_1 C_2 is fulfilled.

But a consideration of the geometry of the various steps will show that if Q′ Q_1 Q_2 are approximately in a straight line, the *true* characteristic of the machine will also be very nearly straight. Now, the earlier part of O Q is very nearly straight, so that the machine can be made to automatically regulate, provided that the current drawn from it is not such as to cause the field magnets to show any signs of approaching saturation. From O K_1 the number of turns in both sets of coils can be calculated, from K′ K_1 that of the series coils alone.

The constancy of the external E.M.F., which the compound wound-machines of good makers maintain, is very remarkable.

Books.

A History of Cumberland. By RICHARD S. FERGUSON, M.A., Chancellor of Carlisle. Elliot Stock.

IN this contribution to the useful series of "Popular County Histories," the author takes a very much stricter view of his task than most of his predecessors. In fact, he begins by limiting himself to the somewhat narrow scope which the old-fashioned county historian took in the "General Introduction" prefixed to his ponderous volumes. Mr. Ferguson is probably right in thus interpreting a county history to mean a history of the county and nothing more, but this treatment of his subject has some very decided disadvantages. It precludes him from dealing with individual persons and places, and from varying his narrative with accounts of abbeys and churches, castles and manor-houses, and of the "worthies" who have helped to make their birthplace illustrious. The result is that his book is not so entertaining to read as it might have been; but, on the other hand, it is extremely instructive, and affords as complete a history of the condition of Cumberland from prehistoric to modern times as one could desire. On the earliest period there is, indeed, little to be said, for up to the present time no implements of the Palæolithic Age have been found, either in caves or river-drift, in any part of the North of England. Glaciers, in all probability, covered the whole area, and when these disappeared and the land was occupied by the Neolithic races, Cumberland was a tract of uncleared forest, morass, and mountain, with, perhaps, three great meres filling the valley of the Eden. When the Romans invaded the country, it was little better in most parts than a cold and watery desert; the air was chilly and the sun but seldom seen. But however uninviting a region, the invaders thought it worth retaining, and the evidences they have left of their occupation of the land are among its most remarkable features. These are depicted with considerable skill by Mr. Ferguson, who takes the reader on a circular tour through the district, and endeavours to call up before his eyes what they would there have looked upon in the year 300 A.D.

The tourist and his guide find at Ravenglass,—now an insignificant town, with a harbour choked with sand,—"a busy scene, full of craft loading and unloading. Wild-looking men from Hibernia are discharging cargoes of cattle, with a total absence of regard for what the cattle feel; while Spaniards and Italians, with much more care, are unloading from their craft great *amphoræ* full of wine, olives, anchovies, sardines, *garum*, and other luxuries which the Romans love, and have taught the Britons to love, or to pretend to do. In return they are shipping, among other commodities, large sporting dogs and dejected-looking natives, some of whom are recruits for military service, others to be sold as slaves. The beach is strewn with bales and packing-cases. Foreign sailors stroll to and fro, and mix with the soldiers of the garrison who are off duty, and chatter with the women of the town. By special invitation we take up our abode for the night in the Tribune's villa, and from the guests at his table we learn much as to the trade and commerce of the district, while the Tribune's wife shows us with pride a necklace of British pearls, collected from one of the rivers which form the harbour. She also calls our attention to the rose-coloured plaster of the walls, on which mythological and other figures are floating in mid-air, as it might be; while in a niche, in the western wall of one of the rooms, stands a marble bust of the Emperor, presented by himself to the Tribune."

What amount of truth there may be in this fancy picture of Roman Cumberland we will not pretend to say, but the extract will show that Mr. Ferguson is by no means a dry historian, dealing only with hard facts and figures. In truth, he is rather open to the charge of want of dignity in his treatment of history. Such expressions as, "No lapidary inscriptions, bar one, have been found at Ravenglass"; "The Celtic race was, compared with their non-Aryan predecessors, a set of very ugly customers," &c., are unnecessarily lively, and the author's excursions into that land of freedom from whence derivations are brought back deserve the same epithet. He tells us, for instance, that from the Danish term *by*, corresponding with the Saxon *ton*, we get "bye-laws"—*i.e.*, "town laws," and that the *lug-mark*—a bit cut out of a sheep's ear that it may be recognised by its owner—is really the *lögg-mark* or legal mark, from the Icelandic *lög*, *i.e.*, law. We are quite ready to recognise the great influence on the nomenclature of the district exerted by the Scandinavian settlers, but its acceptance will not be promoted by such advocacy as is here involved.

We cannot follow Mr. Ferguson in tracing the gradual growth of the kingdom of Cumbria,—the name seems to have been first applied to the district of Galloway, Strathclyde, and parts around Carlisle at the end of the ninth century,—nor the Norman settlement, with the various baronies into which the territory was carved. The subject is well treated by Mr. Ferguson, who seems to have a very complete knowledge, not of the country only, but of its successive lords. He gives an excellent account of Carlisle, a royal city, enjoying special privileges; and the narrative of Border warfare,—peculiar to no one age, but becoming systematic and for a set purpose in the reign of Henry VIII. and afterwards,—is extremely good. An entire chapter is rightly given to the risings in '15 and '45, and one may say that with the Battle of Culloden the history of Cumberland comes to an end. There was, indeed, a contest of another character between the Bentincks and the Lowthers, which was fought out to the bitter end in the eighteenth century, and of this Mr. Ferguson has given a full account; but of other

incidents the county chronicle is destitute. By slow degrees commerce and agriculture have improved, and with the development of the latter, and the consequent enclosure of common lands, the manly race of "statesmen" (estatesmen) has decayed, and is fast dying out. However inevitable the circumstance, we cannot but regret it. We remember, with gratitude, what all England owes to it.

Factory Accounts, their Principles and Practice. By E. GARCKE and J. M. FELLS. London: Crosby Lockwood & Co.

THE accountant of bygone days would find that the modern methods of production had, in many instances, rendered it necessary for him to multiply his books and greatly extend his operations. Indeed, the different branches of work in a large manufactory present many distinct features, each requiring a separate education; and our authors show that the "works" accounts of a factory,—as distinct from the office or commercial accounts of the same concern,—may advantageously be treated on a scientific basis. The sooner the rough-and-ready element is made to give place to systematic and accurate records, the more satisfactory it always proves both to employer and employed. We have recently commented upon the disinclination frequently evinced by the latter, in the case of strikes, to accept corroboration from books of the statements made by their employers. Their view is, probably, that books and figures can be made to prove anything, and that they themselves are powerless to prevent undue advantage being taken of this. Our authors' opinion upon this point is that under a well-organised system of factory accounts "each employé feels that he is contributing to the attainment of accurate records of costs; and thus, on the occasion of strikes, have less hesitation than they otherwise would in accepting the results shown by the books as correct, and as based upon fair principles." This satisfactory state of things, we apprehend, will hardly be brought about until the workman is also educated up to a more intelligent and correct idea of the real nature of the relations between himself and his work on the one hand, and his employer and his capital on the other,—points which the leaders of some of the recent strikes have persistently misrepresented. This was particularly noticeable during the recent strike at the Spittlegate Ironworks, Grantham,—a case, of course, in which the authors' remarks would apply with more force than in those of the miners and dock labourers. The work before us deals exhaustively and clearly with all the multifarious details of the different departments of factories, and is copiously illustrated by specimen rulings and useful diagrams. Among the important matters dealt with in the appendices are the Acts relating to Income-tax, Insurance, and Rating of Machinery. The latter subject is of especial interest at the present time, as it is once more before Parliament. Several cases and authorities are quoted, full reference being given throughout the book for such quotations. It is carefully arranged, and is accompanied by a short glossary of terms, and a very complete index.

VARIORUM.

"FIRE BRIGADE DRILLS, with Hints on Management," and "Rules and Regulations for Volunteer and other Fire Brigades," are two very excellent little handbooks, just re-issued in new and revised editions by Messrs. Shand, Mason, & Co., of Upper Ground-street, Blackfriars. The first-named handbook is supplemented by some useful rules for ambulance work. The second of the two handbooks is prefaced by a hint that the use of the term "volunteer," as applied to fire-brigades, should, as far as possible, be avoided, "as its use has been made the excuse for non-payment of legitimate charges for assistance and appliances by insurance offices, and also owners of property, who have suffered by fire." So mean and paltry an excuse has, we regret to learn, "been admitted in more than one test case before eminent judges." This handbook gives some very useful directions to be observed by inmates of buildings in the event of fire, the precautions to be taken against the occurrence of fires, and hints on the choice and management of petroleum lamps. The two handbooks together will be found very useful in large establishments and public institutions. ——"The Year-book of Photography and *Photographic News* Almanac for 1890" (London: Piper & Carter) purports to contain "the results of photographic experimenting during the year 1889, and special contributions by leading photographic authorities, professional and amateur." Dry-plates and other improvements have made photography so popular as an aid to the student and the tourist that we can have no doubt as to the utility of the "Year-book" now before us, which contains lists of photographic societies and clubs, standard formulæ and memoranda, and a great mass of information on photographic subjects. It also contains a portrait of the distinguished French *savant*, M. Alexandre Edmond Becquerel, who has done much for photography. ——"The Handbook of Stations, Junctions, Sidings, Collieries, &c., on the Railways in the United Kingdom," by Henry Oliver and John Airey, of the Railway Clearing-House, London (published there and by McCorquodale & Co.), has now reached its seventh edition. It is alphabetically arranged, and purports to show "the accommodation at each station, maximum crane-power, county, railway on which situated, and exact position." It is clearly arranged and well printed, and cannot but be found useful in every business house. ——"The Garden Oracle" for 1890, by Shirley Hibberd, Editor of the *Gardeners' Magazine* (London: 4, Ave-Maria-lane), has now attained to its thirty-second year of publication—a fact which in itself attests the value and usefulness of this "illustrated floricultural year-book," to give it its subsidiary title. ——"Index to the First Volume of the Parish Registers of Gainford, in the County of Durham. Part II. Marriages: 1569-1761" (London: Elliot Stock). This is the second instalment of a very useful though unpretending work, the first part of which we noticed last year. The compiler, whose name does not appear on the title-page, is setting an example which might be followed with advantage by people of leisure and means in other parishes. Such work deserves the thanks of antiquaries, genealogists, and historians. The vicar, we understand, is bearing the cost of printing the work. ——New Zealand's material resources and commercial activity are very clearly treated of in "Two Addresses by the Presidents of the Chamber of Commerce, Canterbury, N.Z.," in 1886 and 1889, and now republished by Messrs. Wm. Clowes & Son (Limited), Charing-cross. The address for 1886 is by Mr. G. G. Stead, and that for 1889 by Mr. A. Kaye. ——The *Asclepiad*, No. 25, vol. vii. (London: Longmans, Green, & Co.) is the most recently-issued part of what claims to be "a book of original research and observation in the science, art, and literature of Medicine, preventive and curative." It is entirely written by Dr. B. W. Richardson, F.R.S., and, needless to say, contains a good deal of matter interesting to the sanitarian and even to the "general reader." Dr. Richardson has been known for many years as a "cyclist" and a friend of "cycling;" but in his article on "Cycling and Physique," in the present number of the *Asclepiad*, he strongly deprecates the too ardent pursuit of that means of physical exercise. Without laying down as a hard and fast rule that cycling ought never to be commenced by boys or girls, Dr. Richardson says he is satisfied that "it is always best to delay the commencement of cycling until the body is closely approaching to maturity." There is an interesting monograph, with portrait, of Alexander Monro, M.D., F.R.S., the founder of the Edinburgh Medical School. "Monro *Primus*," as he is called, to distinguish him from his son Alexander, was born in 1687, and died in 1762. He was mainly instrumental in building the first Edinburgh Royal Infirmary (rebuilt some fifteen or twenty years back), and assisted the architect Adam (not "Adams," as Dr. Richardson, or the printer, puts it) in planning it. The work of erecting the Infirmary was, it appears, taken up by the inhabitants with great spirit and unanimity. "The proprietors of many stone quarries made presents of stone, others of lime; merchants contributed timber; carpenters and masons were not wanting in their contributions; the neighbouring farmers agreed to carry the materials gratis; the journeymen masons contributed their labours for a certain quantity of hewn stones; and, as the undertaking was for the relief of the diseased, maimed, and lame poor, even the day labourers would not be exempted, but agreed to work one day in the month gratis towards the erection of the building." As Dr. Richardson remarks, this is a very pleasant picture of sympathetic devotion to a great work. ——*Science for All* is the title of a new serial work, the issue of which has just been commenced by Messrs. Cassell & Co., Limited (Belle Sauvage-yard). Part I., which is before us, gives as a frontispiece a diagram printed in colours, showing the order of succession of the various rocks composing the crust of the earth, with more especial reference to those found in England. The work is clearly printed on good paper, and is well illustrated. One of the most interesting articles in Part I. is on "A Piece of Limestone," written by Prof. H. Alleyne Nicholson. This new serial is likely to meet with wide appreciation. —— *Cassell's Family Magazine*, which issues from the same press, continues to maintain its reputation for varied and interesting reading. One of the best articles in the April number is on "A Yorkshire Dale," by G. Vickars-Gaskell. It is well illustrated. ——The *Leisure Hour* (published at 56, Paternoster-row) for March contains an interesting article on "The Newspaper Printing Press of To-day," with special reference to "cut-work." The various "processes" by which blocks are now made, and the methods of printing them, are described in detail. Some useful hints are given for the guidance of draughtsmen who have to prepare drawings by reproduction by "process." The April number of the same periodical gives an interesting "unwritten chapter" about Chat Moss, upon which it appears that Mr. William Roscoe introduced a railway, designed by Mr. Robert Stannard, about the year 1816. The railway was designed to assist in the work of cultivating the Moss, and the rails were of wrought iron, like an inverted V, thus ⩚, the wheels being V-grooved so as to fit the rail. ——The *Sunday at Home*, published at the same office, contains, in its April number, a second series of "bell mottoes," collected by Mr. W. J. Gordon. It also gives an illustration, by permission of Messrs. Doulton, of Mr. George Tinworth's terra-cotta panel, "At the Foot of the Cross." ——Among other magazines reaching us from the same office are the *Boy's Own Paper* and the *Girl's Own Paper*, both of them excellent publications for youth. The two last numbers of the *Girl's Own Paper*, for March and April, contain interesting articles by Mrs. Holman Hunt describing Mr. Flinders Petrie's discoveries in "The Fayum," Egypt, copiously (if somewhat roughly and "sketchily") illustrated. The same two numbers also contain articles on "Celebrated Monuments of Eminent Women," very ably illustrated by page engravings by R. Taylor from drawings by Mr. H. W. Brewer. The monument illustrated in the March number is that of Lady Berry, in Stepney Church, whose name is associated with the well-known legend of the ring and the fish. The April number gives an account and illustration of Lady Bankes's monument in Riselip (or, as it is now spelt, Ruislip) Church, near Pinner, Middlesex. ——*The Church Monthly* (edited by Frederick Sherlock, and published at 30, Bridge-street, Westminster) is perhaps the best of the cheap magazines available for parochial circulation. It is published for a penny, is varied in its contents, and fairly-well illustrated. One article in the March number is on the interesting parish church of Holy Trinity, Dartford, of which four illustrations, specially engraved from photographs, are given. The article is written by Mr. Robert Crane, who refers to the discovery, in 1833, of an ancient fresco, measuring some 20 ft. by 12 ft., illustrating the story of St. George and the Dragon. The writer says that this fresco was formerly fully visible, but that some years back the organ was placed in front of it (almost completely obscuring it) by the then vicar, the Rev. J. G. Blomfield, M.A., and his cousin, Mr. (now Sir) Arthur Blomfield, the well-known architect. Can this statement be correct? ——"Everybody's Pocket Cyclopædia of Things Worth Knowing, Things Difficult to Remember, and Tables of Reference" (London: Saxon & Co.) is a useful little book, but we say this without being able to guarantee its accuracy in all respects. Some of the matter under the heads "Architectural" and "Science" is questionable. The book sells for 6d. ——Shelley & Co.'s "Complete Press Directory for 1890" (published at 5, Leadenhall-street, E.C.) is a very handy publication for the office. It has special features of its own, not the least useful being a summary of the leading newspaper law cases for the year 1889, recording important decisions affecting copyright and the law of libel. It is well printed and arranged, and sells for 1s.

Maps.

FROM Mr. Edward Stanford, of Cockspur-street, we have received two useful maps of London. One of them shows the areas granted to the electric light companies under the Electric Lighting Acts of 1882 and 1888. The areas granted are mostly at the West End. The East End is not at present interfered with by any of the companies, but a considerable portion of the south-eastern district has been allotted to the London Electric Supply Corporation. The other map shows railway and tramway schemes, and other works (including those proposed by the London County Council) for which powers are being sought in the present session of Parliament. Both maps are clearly printed and coloured, and will be found very useful for reference.

RECENT PATENTS.

ABSTRACTS OF SPECIFICATIONS.

8,019, Ventilation by Sash-windows. W. Macdonald.

This invention consists in placing a continuous piece of wood or metal to block up the bottom sash. This piece is formed with a rebate and bead behind which the bottom rail of sash rests. When this block is in position the meeting-rail of the lower sash is some distance above the meeting-rail of the upper sash, and the space thus maintained is a continuous source of ventilation all along the length of the sash.*

8,129, Parquetry. S. Ingham (and others).

The ordinary method of making and fixing parquetry is to prepare the small pieces or patterns in the workshop, afterwards fixing them upon the floors already laid to receive them. This is laborious and costly, and the present invention is designed to remedy this. The pieces of prepared marquetry are attached at the manufactory to suitable lengths of floor-boards, passed through thicknessing and smoothing machines, then taken to the floor, and laid in large or small blocks or sections cut by the workman to fit special positions when necessary.

8,182, Kitchen Fireplaces. J. Burford.

According to this invention, swing and movable bars are used for the bottom and front of the grate, which being actuated admit of the height of the fire being kept uniform relatively to the boiler-flue opening at back, but varying the height of the fire in front. Arrangements are also incorporated in the improvements for increasing and directing the draught.

8,444, Sash-fastener. W. Macdonald.

In order to effectually secure the windows to which the improvements noted in the first paragraph (8,019) have been fitted, the inventor has designed a special fastener, which consists of a piece of metal screwed to and projecting from the inside lining of the window-frame, and through this works a long pin or screw, screwed into a hole on the upper sash. There being only two or a limited number of holes the sash can only be raised a certain height.

8,795, Roofing, &c. A. N. Ford.

In manufacturing an improved material for roofing, wire netting of a suitable mesh is, according to this invention, used, and a thin fabric such as canvas. This is passed through a pair of rollers, while a heated liquid composition is fed on to the material.

2,508, Plasterers' Lathing. B. Westerdahl (Sweden).

This improved lathing consists of a series of wood splints of angular shape, connected together by means of wires, which wires are twisted together between each pair of splints, preferably in different directions on opposite sides of the same splint.

NEW APPLICATIONS FOR PATENTS.

April 1.—5,029, J. Trelioning and J. Westaway, Fireproof Curtains for Theatres, &c.—5,082, J. Watkins, Hinge or Fastener.

April 2.—5,096, O. Wagner and E. Howard, Fastenings for Windows.—5,104 and 5,105, H. Lever, Automatic Sash-fastener.—5,112, T. Collen and R. Wilson, Opening and Closing Window-sashes.—5,118, H. Beeson, Machinery for Bevelling Glass.—5,129, J. Plumridge and others, Band Saw Guides.—5,161. J. Gillespie, Water-closets.

April 3.—5,175, G. Shanks and others, Stock and Fittings for Brick Moulds.

April 5.—5,268, S. Jennings, Draw-off Taps for Baths, &c.—5,270, G. Jennings, Removable Stoppers for Manhole Covers, &c., for Drainage Purposes, &c.

April 8.—5,310, Sharp, Roofing with Slates.—5,349, C. Weber and G. Freeman, Artificial Stone Slabs, &c.—5,363, S. Chambaz and L. Schmid, Sash-fasteners.

April 9.—5,403, J. Smeaton, Flushing and Water-waste-preventing Apparatus for Closets, &c.—5,415, W. Horn, Brick-machine.

April 10.—5,459, W. Vears and others, Storage Cisterns or Water-waste Preventers.—5,466, W. Thompson, Holding Doors or Window Sashes in a more or less open position.—5,475, A. Booth, Sawing-machines.

April 11.—5,515, P. Justice, Material for Building Purposes.—5,533, O. McLean, Asphalte Paving.

April 12.—5,544, J. Pride, Cowl or Ventilator.—5,554, G. Salter and H. Trubshaw, Locks and Latches.—5,555, T. Benson, Ventilating Rooms or Buildings.—5,572, W. Millington, Tubular Boiler for Fireplaces or Stoves.—5,581, G. Skelsey, Cement Kilns, &c.—5,588, R. Chantrey and W. Peters, Water Waste Preventers. — 5,593, H. Newey, Water Waste Preventing Cistern for Flushing Closets, &c.—5,595, W. Ingram, Adjusting Spirit Levels to any required gradient.

PROVISIONAL SPECIFICATIONS ACCEPTED.

2,828, R. Friend, Opening and Closing Skylights, &c.—3,162, J. Merryweather, Paving Material.—3,340, S. Sutcliffe, Hinge.—3,346, F. Barnett, Low-level Composite Bridges.—3,671, B. Mills, Hinges and Door Checks.—3,994, J. Anderson, Morticing Machines.—4,129, G. Sykes, Window Fastener.—4,316, J. Day, Sash Fastener.—4,377, J. Marsh, Attaching Door-knobs or Handles to Spindles.—4,497, J. Bradley, Hot Water Apparatus.—4,504, E. Lee, Kiln for Burning Bricks.—4 603, C. Mackey, Roses of Door-knobs, &c.—3,431, J. Naylor and H. Williams, Moulding and Pressing Semi-dry Bricks.—3,489, J. Themas and T. Stabb, Raising and Lowering Window Sashes. — 3,882, T. Birtwistle, Safety Hinge for Folding Ladders.—3,883, C. Whitfield, Fireplaces.—3,942, G. Smith and B. Cooper, Joining Lead Pipes. — 4,147, E. Miller, Wood Working Machinery. — 4,155, C. Crosby, Firegrates. — 4,289, J. Cullen, Gas Bracket and Pendant.—4,662, J. Bayly, Bevelling Square.—4,705, G. Tweedy and B. Laurence, Wood Blocks, &c.—4,735, F. Averill, Flush Bolts.—4,900, R. Roberts, Chimney Pots, &c.

COMPLETE SPECIFICATIONS ACCEPTED.

Open to Opposition for Two Months.

8,511, E. Bussy, Bricks, White Enamel, &c.—8,654, F. Davies, Fastenings for Doors, &c.—14,787, A. Mitchell, Joint for Drain-Pipes, &c.—17,447, E. Christie, Door Chain and Latch. — 19,246, J. Wilson, Fireproof Hearths, &c. — 19,724, H. Aland, Fans for Producing or Inducing Currents of Air.—295, W. Kneen, Attaching Door Knobs to their Spindles.—2,619, J. Schultz and E. Hopf, Flooring for Roofs, &c.—2,966, G. Bayley, Fastenings for Window-sashes.—9,045, G. Belling, Window-sash Fastener. — 10,824, J. Brunton and L. Griffiths, Mixing Materials for making Artificial Stone, &c.—16,215, A. Boult, Metallic Crossbars.

* If we read this description aright, something very similar, if not absolutely identical to what appears to be described, has been in use for many years.

RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

April 14.—By C. D. FIELD & SONS.

Covent Garden—36, Wellington-st., f., r. £100 .. £3,320
Southwark—206 and 208, Southwark Pk.-rd., u.t. 36 yrs., g.r., &c., £13. 2s. 600

By L. FARMER.

Kilburn—11, 12, and 13, Alpha-mews, u.t. 67 yrs., g.r. £11. 10s., r. £75 260

April 15.—By H. HAINES & SON (at Mason's Tavern).

Hackney—2 to 12 (even), Frampton Pk.-rd., u.t. 65 yrs., g.r. £48, r. £166 1,425

By A. G. THOMSON & CO.

Wandsworth—1 to 6, Louvaine-rd., u.t. 72 yrs., g.r. £45 1,700

By W. B. HALLETT.

Stroud Green—25, Albany-rd., u.t. 94 yrs., g.r. £10 590

By DEBENHAM, TEWSON, & CO.

City—The letting of 34, Old Change, area 6,420 ft., realised £1,200 p.a.
Camberwell—25 and 27, Chinmleigh-st., u.t. 15 yrs., g.r. £6. 16s., r. £44 170

By E. & H. LUMLEY.

Hyde Pk.—154, Westbourne-ter., u.t. 52 yrs., g.r. £5, r. £140 2,000

By SHERRIN & COLTMAN.

Oakley-sq.—No. 39, u.t. 64 yrs., g.r. £23, r. £90.. 1,100

By DOWSETT & CO.

Camberwell—F.g.r. of £42, with reversion in 8 yrs. 2,600
Charing Cross—Moiety of 13 and 13a, Cockspur-st., u.t. 37 yrs., r. £300 4,200
Fulham-rd.—Nos. 227, 229 and 231, f., r. £225 pa.. 5,510
Nos. 69 and 73, Fulham-rd., f., r. £200 pa..... 3,350
Nos. 18 and 19, York Mews, f., r. £90 pa 1,400
Brompton-rd.—Nos. 48 to 54 (even), Chapel-pl., f., r. £166. 8s. 1,620
Fulham-rd.—Nos. 243 and 245, u.t. 22 yrs., g.r. £30, r. £180 1,500
Nos. 96, 98, 102 and 104, Fulham-rd., u.t. 60 yrs., g.r. £240, r. £445 1,995
Nos. 80 and 92, Fulham-rd., u.t. 61 yrs., g.r. £30, r. £292. 10s. 3,030

By WILKINSON, SON & WELCH (at Brighton).

Brighton, Norfolk-buildings—Sets of stabling, f., and 6, Norfolk-buildings, u.t. 13 yrs, g.r. £40 3,000
5, Victoria-rd., f., r. £40 pa 630
6, Clifton-pl., f., r. £32 pa 520
High-st.—"The Royal Albert" beer-house, u.t. 9 yrs., g.r. £1. 11s. 3d. 95

APRIL 16.—By MOORE & TEMPLE.

Canonbury—30 and 32, Northampton-pk., u.t. 36 yrs., g.r. £2, 13s. 610

By A. RICHARDS—(At Enfield).

Enfield—The Old Post-office, c. £500

By LUCKHURST & LLOYD.

Clapham, Cavendish-rd.—"Turret House," f. 600

By CANE & CO.

East Dulwich—63, Oakhurst-grove, u.t. 77 yrs., g.r. £10, r. £38 305

By MOSS & JAMESON.

Brixton—F Block of stabling, r. £460 p.a. 5,975

By D. YOUNG.

New Cross-rd.—Nos. 233 and 235, u.t. 55 yrs., g.r. £14, r. £100 900

By C. RAWLEY CROSS.

Chiswick — "Rupert House," and a plot of land, f. 2,110
West Kensington — 75, Westwick-gardens, f., r. £42 590
Shepherd's-bush-rd.—No. 31, u.t. 85 yrs., g.r. £3, r. £65 925
West Kensington—F.g.r. of £49, with reversion in 88 yrs 1,225

APRIL 17.—By A. R. SAVAGE & SON.

Mile End-rd.—Nos. 469 and 471, u.t. 12½ yrs., g.r. £28 540

By PENNING & DANIEL.

Kensington—32, Victoria-rd., u.t. 40 yrs., g.r. £12 1,550

By SEAGRAVE, TAYLOR, & CO.

Pentonville, Warren-st.—A range of stabling and warehouses, u.t. 50 yrs., g.r. £62 1,880

By NEWBON & HARDING.

Stoke Newington—21 and 23, Woodland-row, u.t. 74 yrs., g.r. £10, r. £52 475

By FAREBROTHER, ELLIS, & CO.

Lee-rd.—F.g.r. of £30 p.a., with reversion in 71 yrs 950
F.g.r. of £210 p.a., with reversion in 26 yrs..... 8,300
F.g.r. of £10 p.a., with reversion in 22 yrs. 1,650
High-rd—"The Prince Arthur" beerhouse, f., r. £45 820
Nos. 262 to 272 (even), High-road, f., r. £227 p.a. 4,160
F.g.r. of £8 p.a., with reversion in 63 yrs..... 235

By MULLETT, BOOKER, & CO.

Hyde Pk.—33, Connaught-sq., u.t. 33 yrs., g.r. £15 1,900
2, Cumberland-mews, u.t. 25 yrs., g.r. £8 600

By E. STIMSON.

Peckham—19 and 21, Kirkwood-rd., u.t. 75 yrs., g.r. £10 300
Walworth—14, Sutherland-sq., f., r. £32 p.a. 400
New Cross—3, Casella-rd., u.t. 67 yrs., g.r. £5, r. £36 270
14, Casella-rd., u.t. 67 yrs., g.r. £5, r. £28..... 265
Southwark—31, Merrick-sq., u.t. 35 yrs., g.r. £6.. 320
30 and 31, Great Bland-st., u.t. 5½ yrs., g.r. £9, r. £62. 8s. 77
Lambeth—25 and 27, Glasshouse-st., f., r. £65 p.a. 500
Walworth—83, Lorrimore-rd., u.t. 61 yrs., g.r. £5. 415

By A. H. TURNER & CO.

City—12, Crane-ct., f., r. £55 p.a. 2,000
Bryanston-sq.—35, Brown-st., u.t. 11 yrs., g.r. £10, r. £40 150
Hampstead, Holly Mount—"Hollybush Cottage," c., r. £25 340
Islington—6, Prospect-pl., f., r. £20 260
St. Luke's—52, Moreland-st., f., r. £20 260
Hendon—f.g.r. of £145. 4s., with reversion in 75 yrs 3,575

April 18.—By J. T. ATTON.

Bethnal Green—88 and 92, Green-st., u t. 29 yrs., g.r. £10. 6s. 400
45 and 47, Nottingham-st., u.t. 18 yrs., g.r. £10, r. £41. 12s. 165
Mile End—274 and 276, Burdett-rd., u.t. 71 yrs., g.r. £14, r. £84 860

By VENTOM, BULL, & COOPER.

Kilburn—127, High-rd., u.t. 21 yrs., g.r. £70, r. £130 600

[*Contractions used in these lists.*—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; yd. for yard, &c.]

MEETINGS.

SATURDAY, APRIL 26.

Association of Municipal and Sanitary Engineers and Surveyors.—Home District Meeting at Acton, Ealing, and Hampton.

Royal Institution.—Captain W. de W. Abney, F.R.S., on "Colour and its Chemical Action." II. 3 p.m.

Junior Engineering Society.—Visit to the Deptford Central Station Works of the London Electric Supply Corporation.

MONDAY, APRIL 28.

Surveyors' Institution.—Mr. F. Marshall on "The Principles of the Exemption of Public Undertakings from Rateability." 8 p.m.

Leeds and Yorkshire Architectural Society.—7.30 p.m.

TUESDAY, APRIL 29.

Institution of Civil Engineers.—(1) Further discussion on Sir Frederick Bramwell's paper on "The Application of Electricity to Welding, Stamping, and other Cognate Purposes." (2) Mr. J. Robinson on "The Barry Dock Works." 8 p.m.

WEDNESDAY, APRIL 30.

Civil and Mechanical Engineers' Society.—Presentation of Report and Election of Council. 7 p.m.

Society of Arts.—Mr. T. R. Dallmeyer on "Photographic Lenses." 8 p.m.

THURSDAY, MAY 1.

Guild and School of Handicraft.—Mr. E. Prioleau Warren on "Parlour Architecture." 8 p.m.

Society for the Encouragement of the Fine Arts.—

Mr. Phil. R. Morris, A.R.A., on "Impressionism, Realism, and Philistinism."

Institution of Mechanical Engineers. — (1) The President, Mr. J. Tomlinson, will deliver his Inaugural Address. (2) Paper by Professor A. B. W. Kennedy, F.R.S. 7.30 p.m.

Royal Archæological Institute.—(1) The Worshipful Chancellor Ferguson on "Dummy Grenadiers from the County Hotel, Carlisle." (2) Mr. J. P. Harrison on "Anglo-Norman Ornament Compared with Designs in Anglo-Saxon MSS." 4 p.m.

Society of Arts.—Mr. Lewis F. Day on "Design Applied to Wood-carving" 8 p.m.

Royal Institution.—Annual meeting, 1.30 p.m.

FRIDAY, MAY 2.

Architectural Association.—Mr. Keith D. Young on "Hospitals." 7.30 p.m.

Institution of Mechanical Engineers. — Ordinary General Meeting (continued). 7.30 p.m.

SATURDAY, MAY 3.

Royal Institution.—Captain W. de W. Abney, F.R.S., on "Colour and its Chemical Action." III. 3 p.m.

Miscellanea.

Kells Abbey.—Mr. Webb is about to bring under the notice of the Chief Secretary for Ireland a state of things which would have moved Monkbarns to righteous anger, and the story of which Sir John Lubbock, the author of the Ancient Monuments Protection Act, will scarcely hear without a shudder. It is stated that a portion of the Abbey of Kells, County Kilkenny, is being used for building walls elsewhere; that the ruins at Kilmallock, some of the finest in Ireland, urgently need protection; that the great tumulus at Rathmore is being carted away to repair the neighbouring roads; and that there are numerous other instances in which, if immediate steps be not taken, ancient Irish monuments of great interest will be seriously injured, and possibly destroyed. Existing statutes, it seems, afford no sufficient protection in such cases, and Mr. Webb asks whether there is any intention of legislating with a view of preserving these interesting relics of the past. Surely there should be no difficulty in getting a short Bill through which should effect this desirable object. — *Daily Chronicle.*

Association of Municipal and Sanitary Engineers and Surveyors. — The ninth voluntary pass examination of candidates for the offices of municipal engineers and surveyors to Local Boards, carried out by this Association, was held at the Institution of Civil Engineers on Friday and Saturday, the 18th and 19th inst. Nine entered for the examination, the written portion of which was taken on the first day. The greater portion of the second day was occupied with the *vivâ voce* portion of the examination. The examiners were—(1) For Engineering as applied to Municipal work, Mr. Joseph Lobley, M.Inst.C.E., Borough Engineer, Hanley (Past President). (2) Building Construction, Mr. Jas. Lemon, M.Inst.C.E., F.R.I.B.A., Consulting Engineer, Southampton. (3) Sanitary Science, Mr. C. Jones, A.M.Inst.C.E., Surveyor to the Local Board, Ealing. (4) Public Health Law, Mr. T. De C. Meade, A.M.Inst.C.E., Surveyor to the Hornsey Local Board. The next examination will be held in London in October, 1890.

Vienna.—According to the *Wochenschrift des Nieder-Oestr. Gewerbe Vereins*, 371 buildings, with 5,739 dwellings, have been officially surveyed and given over for public use during the year 1889. Only sixty-two houses, with 727 lodgements, have been pulled down during the same year, and hence the number of dwellings in the Austrian capital has been increased by 5,012, a number far too high in proportion to the increase of population. If this unreflecting activity in the building trade continues, the time for the prophesied "crash" cannot be far hence.

Bank of Spain, Madrid.—We are informed that this large building is to be heated throughout with hot water, and that Mr. Renton Gibbs, of Liverpool, has secured the contract for this part of the work. It is one of the largest contracts of the kind ever undertaken by any firm of heating engineers, and will occupy about six months to complete. There will be no less than twelve miles of piping and twenty-one of Mr. Gibbs's largest boilers, besides 119 coil-cases.

Royal Academy: Architectural School. —The course of lessons on Architectural Modelling has terminated for the session, and Mr. Stannus will commence a series of demonstrations on "Architectural Ornament: in Panel, Frieze, and Capital" on Monday, May 5, at 6.15 p.m.

Weighing Machinery.—At a meeting of the Society of Engineers, held at the Town-hall, Westminster, on Monday, the 14th inst., Mr. Henry Adams, President, in the chair, a paper was read by Mr. William Henry Brothers on "Weighing Machinery and Automatic Apparatus in connexion therewith." The author commenced by commenting on the interest which was beginning to be felt in weighing machinery. He thought it surprising that so little was popularly known of the scientific principles which underlie the construction of appliances of such general utility. There were extant one or two pamphlet treatises on the balance, and fugitive articles were to be found in the encyclopædias, but there was no standard literature on the subject in the English language. The increased interest in weighing machinery was probably due to recent legislation, rather than to the peculiar mechanical conditions which it exemplified. The author pointed out that the Weights and Measures Act of last Session removed a glaring anachronism in previous enactments, in that it provided for the verification and stamping of weighing instruments, whereas those operations had hitherto been confined to weights. The demand for accurate and reliable weighing instruments was on the increase, the many-sided requirements of trade could not now be content with the simple balance with equal or with unequal arms—the *libra* and *statera* of the Romans—and many important improvements in such apparatus had been devised for the convenience of the public. The statement that the fundamental principles of the balance remained unchanged from the earliest times, preceded a description of the American torsion balance, which aimed at superseding the knife-edge fulcrum. Weighing machinery in this country was shown to be of an exceedingly diversified character, adapted to the various purposes of trade. The author pointed out how obviously unreasonable it was to expect weights and measures inspectors,—who were, as a rule, without technical or mechanical training—to adjudicate intelligently upon the complicated weighing machinery in use at the present day; and referred to the new edict requiring all newly-appointed inspectors to pass a technical examination. If to this guarantee of a certain degree of special knowledge in inspectors were added the official recognition of such forms of weighing instruments only as would answer to scientific requirements, and not tend to the commission of fraud, the author confidently anticipated that the weighing apparatus in use in the United Kingdom would eventually come up to a standard of excellence commensurate with the importance of the work it was called upon to perform. The German laws relating to weights and measures were cited as worthy of imitation in many respects; and several notable precision balances of English make were described in proof that the British manufacturer is not behind his compeers of other countries. The author then proceeded to trace the gradual evolution of automatic weighing apparatus, from the simple but ineffective pendulum balance down to the Snelgrove electric self-operating and self-indicating weighing machine, manufactured by Messrs. Avery, of Birmingham. A number of automatic machines were passed in review, most of them being illustrated by diagrams.

New Buildings for the Salvation Army. —At Walthamstow six large shops and "Citadel" buildings, capable of accommodating 1,000 persons, are to be erected in the High-street, for the Salvation Army. The total cost will be about 4,500*l.* Mr. J. Williams Dunford, of London, is the architect.—At Sunderland, the site of the old Lyceum Theatre, which has been vacant for some time past, situate off High-street, has just been acquired by the Salvation Army for 2,000*l.* Mr. Dunford is preparing plans for the erection on the site of a large "Citadel" capable of accommodating 3,000 persons, at an estimated cost of 3,500*l.*

The Turners' Company again offer their Silver Medal, the Freedom of the Company, and (subject to the consent of the Court of Aldermen) will also obtain the Freedom of the City of London for any workman, whether master, journeyman, or apprentice in the trade in the United Kingdom, who may send in the best specimen of turning in pottery, stone, and glass. The specimens must be sent in during the week ending October 25. Further particulars can be obtained of Mr. Edgar Sydney, at 53, Gresham House, Old Broad-street.

The Lighting of Warehouses. — The greatly increased value of land, and the overcrowded state of buildings in the City of London frequently oblige warehousemen and merchants, wishing to extend old premises or to erect new ones, to build them either in whole or in part in positions where day-light cannot be obtained by ordinary windows either in front, back, or sides. A possible means of obviating these difficulties to a very great extent is now to be seen in a large block of buildings situated in such a position that ordinary windows are not possible. We refer to the large extensions which the Fore-street Warehouse Company have recently made to their premises at the back of Fore-street. The architect is Mr. Herbert Ford, of 21, Aldermanbury. The extensions consist of two blocks having an area of about 4,000 ft. and 2,100 ft. respectively, and both blocks are practically roofed with polished plate-glass in large squares (9 ft. by 2 ft.). To accomplish this Mr. Ford has availed himself of the Bessemer steel lead-clothed bar (British Patent) system of glazing. The large plates of glass are held firmly in their places by means of a narrow frame of steel and lead, which automatically allows for expansion and contraction, and also makes a water-tight joint impervious to rain or dust. The light thus admitted at the top is, with little interruption, flooded down and distributed by means of galleries on the different floors over the whole area. Goods, we are assured, can be most perfectly seen and their texture and colour matched in any part of the building, even in the basement. Roofs glazed on the above plan (of which there are a good many now in the City) are exceedingly light, and at the same time very strong. We called attention to this method of lighting four years ago.

The Architectural Association Soiree was held on Friday, the 18th inst., in the Westminster Town-hall. There was, as usual, a large attendance of members. The first part of the programme consisted of a concert, in which Messrs. C. D. Imhof, J. Dixon Butler, A. C. Bulmer Booth, E. A. Lambert, Edgar H. Homan, Arthur Thomas, C. Gordon Killmister, and Captain J. Watson took part. The songs of Captain Watson and Mr. Arthur Thomas, and the violin performances of Messrs. Lambert and Homan, received well-merited encores. The second part of the proceedings consisted of what was described on the programme as "A Grand Variety Entertainment," entitled "Looking Forward, or a Professional Meeting of the Future,"—the very remote future, we may safely say. It was, in fact, a "nigger entertainment." The President of this "meeting of the future" wore a full-bottomed wig and a purple robe, and his address dealt with and "afforded an easy solution" of "many of the much-vexed topics of the time," including professional education, examination, and registration. There were a few striking "hits" in the dialogue, which was interspersed with songs and dances. Questions of professional practice, such as that of competitions, were humorously dealt with by "the meeting," and jokes were cracked at the expense of "good old 'Gwilt.'" The performers in this amusing travesty were Mr. H. O. Creswell ("President"), Messrs. A. C. Bulmer Booth and C. H. Brodie ("Secretaries"), Messrs. J. Dunn, P. Bowyer, R. Welsford, and T. Rutter (banjoists); Mr. E. Garth (*sifleur*), Mr. C. G. Killmister (pianoforte), Mr. S. B. Beale (bones), and Mr. E. A. Lambert (tambourine). They all acquitted themselves well of their several parts.

Fine Art Exhibition at Cordwainers' Hall.—An interesting exhibition of works of art was opened on Monday last, in the Hall of the Worshipful Company of Cordwainers, No. 7, Cannon-street, E.C. All the pictures and other works exhibited are the property of members of the Company, there being no outside exhibitors. Though the number of contributors is small, the collection is a very interesting one, including as it does pictures by George Morland, F. Sandys, Teniers, Wouvermans, Wynants, Terburg, Cuyp, Greuze, Nicolas Poussin, Old Crome, Constable, and other masters. There is also a good show of engravings by Albert Durer, Bartolozzi, and others. Water-colours, miniatures, porcelain and pottery, bronzes, and rare printed books are also well represented. The only exhibits at all associated with the craft over which the Cordwainers' Guild formerly held sway are some good ancient and modern specimens of bookbinding. The exhibition will remain open every week-day from 11 a.m. to 6 p.m. until May 17.

The Metropolitan Water Companies and the Public.—The London County Council have not failed to see that the quinquennial re-assessment of property in London, which will come into force next year, will largely increase the sum of money which must eventually be paid by the ratepayers when London becomes possessed of the property of the Water Companies. The Council has therefore determined to bring in a Bill to suspend the powers of the Water Companies to increase their charges for water consequent upon any increase that may be made in the assessment of property in the country. This resolution will commend itself to London ratepayers. The system of charging upon the rateable value of a house is not equitable, seeing that rateable value and the amount of water consumed often bear no relation to each other, and already through the existing arrangements many London householders are paying largely in excess of that which would be a proper amount for the water used. The Vestry of St. James, Westminster, has determined to memorialise Parliament in support of the Council's views, and it may be expected that other local authorities will adopt the same course. The action of the Council makes more necessary than before the acquirement by London of its water-supplies, but the basis of compensation is one which is not now easier of settlement than when the subject was under consideration some years ago.—*The Lancet*.

PRICES CURRENT OF MATERIALS.

TIMBER.	£.	s.	d.	£.	s.	d.
Greenheart, B.G. ....ton	6	15	0	7	5	0
Teak, E.I. ....load	11	0	0	14	0	0
Sequoia, U.S. ....foot cube	0	2	3	0	3	0
Ash, Canada ....load	3	0	0	4	5	0
Birch ,, ...	3	0	0	5	0	0
Elm ,, ...	3	10	0	4	15	0
Fir, Dantsic, &c.	2	0	0	3	10	0
Oak ,, ...	2	10	0	4	10	0
Canada	5	10	0	6	10	0
Pine, Canada red	2	10	0	3	10	0
,, yellow	2	0	0	5	5	0
Lath, Dantsic ....fathom	5	0	0	6	0	0
St. Petersburg	5	0	0	7	10	0
Deals, Finland, 2nd and 1st. std. 100	8	0	0	11	0	0
,, ,, 4th and 3rd	7	0	0	7	10	0
Riga	7	0	0	8	10	0
St. Petersburg, 1st yellow	10	0	0	14	0	0
,, 2nd ,, ...	8	0	0	10	0	0
,, white	6	10	0	10	0	0
Swedish	7	10	0	15	10	0
White Sea	8	0	0	17	0	0
Canada, Pine, 1st	15	0	0	26	0	0
,, ,, 2nd	10	10	0	17	0	0
,, ,, 3rd, &c.	7	0	0	10	0	0
,, Spruce, 1st	8	15	0	11	0	0
,, ,, 3rd and 2nd ..	6	15	0	8	10	0
New Brunswick, &c.	6	0	0	8	10	0
Battens, all kinds	6	0	0	16	0	0
Flooring Boards, sq., 1 in., prepared, First	0	11	0	0	14	0
Second	0	8	0	0	10	6
Other qualities	0	6	0	0	7	9
Cedar, Cuba ....foot	0	0	4	0	0	4½
Honduras, &c.	0	0	4	0	0	4½
Mahogany, Cuba	0	0	4½	0	0	6½
St. Domingo, cargo average ..	0	0	4½	0	0	6½
Mexican, cargo average	0	0	4½	0	0	5½
Tobasco ,, ...	0	0	5½	0	0	6½
Honduras ,, ...	0	0	5½	0	0	6½
Box, Turkey ....ton	4	0	0	13	0	0
Rose, Rio	15	0	0	20	0	0
Bahia	14	0	0	18	0	0
Satin, St. Domingo....foot	0	0	6	0	1	3
Porto Rico	0	0	10	0	1	3
Walnut, Italian	0	0	4½	0	0	7
METALS.						
IRON—Bar, Welsh, in London tn	8	2	6	8	10	0
,, ,, at works in Wales	7	15	0	8	0	0
,, Staffordshire, in London ..	8	10	0	9	10	0
COPPER—British, cake and ingot	53	0	0	53	10	0
Best selected	55	0	0	56	0	0
Sheets, strong	61	0	0	0	0	0
Chili, bars	48	10	0	0	0	0
YELLOW METAL....lb.	0	0	5½	0	0	6
LEAD—Pig, Spanish ....ton	12	15	0	12	17	6
Sheet, English	14	10	0	0	0	0
Pipe	15	0	0	0	0	0
TIN—Straits	90	15	0	0	0	0
Australian	91	5	0	0	0	0
English Ingots	93	10	0	0	0	0
OILS.						
Linseed ....ton	23	7	6	23	15	0
Cocoanut, Cochin	28	0	0	28	10	0
Cocoanut, Ceylon	25	0	0	25	5	0
Palm, Lagos	24	10	0	24	15	0
Rapeseed, English pale	32	0	0	0	0	0
,, brown	30	7	6	30	10	0
Cottonseed, refined	22	10	0	0	0	0
Tallow and Oleine	21	0	0	40	0	0
Lubricating, U.S.	5	10	0	6	0	0
,, refined	7	0	0	12	0	0
TAR—Stockholm....barrel	1	5	6	0	0	0
Archangel	0	16	9	0	0	0

TENDERS.

[Communications for insertion under this heading must reach us *not later than* 12 *noon on Thursdays*.]

ASCOT.—For new residence at Kennel Ride, for Mrs. K. Throckmorton. Mr. A. H. Attwater, architect, Windsor.:—

C. F. Kearley, Uxbridge (accepted) £2,028 0 0

CONTRACTS AND PUBLIC APPOINTMENTS.

Epitome of Advertisements in this Number.

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.	Page.
Construction of Mixing House, &c. (Sewage Works)	West Ham Council	Lewis Angell	April 29th	ii.
Broken Granite	Hackney Bd. of Wks....	Jas. Lovegrove	April 30th	ii.
Extension of Schools	Burton-on-Trent Sch. Bd	R. Churchill	do.	ii.
Erection and Completion of Parochial Bldgs.	Parish St. Paul's, Widnes	Paul Ogden	do.	xiv.
Cellar	Cobden Club	....	May 1st	xiv.
Main Storm-water Drains	Billesdon U.R.S.A.	J. B. Everard	May 2nd	ii.
Roadmaking and Paving Works	do.	W. F. Ault	do.	ii.
Painting Works, &c.	Midland Railway Co. ...	A. A. Langley	do.	xiii.
Purchase and Pulling down Building Mat.	School Bd. for London	*Official*	May 5th	xiii.
Parcel Sorting Office, Manchester	Com. of H.M. Wks. &c.	do.	May 6th	ii.
Road Works	Lewisham Bd. of Works	do.	do.	xiv.
Making-up Roads	Fry, Smith, & Williams	J. W. Nash	do.	xiii.
Sewerage Works	Barry & Cadoxton L.B.	C. R. Walker	May 8th	xiv.
Road Materials	Norfolk County Council	T. H. B. Heslop	do.	ii.
Extension of Hospital Buildings	Bromley & Beckenham Joint Hospital Board	Jno. Ladds	May 9th	xiv.
Extension of Bank, Southampton	Wilts & Dorset Banking Co.	W. H. Mitchell	May 12th	xiii.
Oak Fencing, Hampstead Heath	London County Council	*Official*	do.	xiii.
Making-up Roads	Southborough Loc. Bd.	W. Harmer	May 13th	ii.
Decorating and Repairing Chapel, Mare-st.	The Committee	W. D. Church and W. Braadbear	May 14th	xiii.
Widening of the Ebbw Vale Branch, &c.	Great Western Ry. Co.	*Official*	do.	xiii.
Poor Asylum, Isle of Man	....	....	May 24th	ii.
Painting, &c., Works, York Sub-district	War Department	*Official*	Not stated	ii.
New Wesleyan Chapel, &c., Manchester	The Trustees	R. Curwen	do.	xiv.
Painting Works, &c.	Sec. of State for War	*Official*	do.	ii.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in.	Page.
Temporary Assistant, County Surveyor's Office	County of West Sussex	£2 weekly	May 3rd	xviii.
Assistant to Surveyor	School Bd. for London	£100	May 5th	xviii.
Borough Surveyor	South Molton T. C....	£100	May 6th	xviii.
Expenditor	Lords, Bailiff, & Jurats of Romney Marsh ...	£250, &c.	May 15th	xvi ii.

BISHOP'S STORTFORD.—For the erection of a new police-station, &c., at Bishop's Stortford, for the Standing Joint Committee of the Quarter Sessions and the County Council for Hertfordshire. Mr. Urban A. Smith, County Surveyor, architect. Quantities by Mr. Alfred Burr :—

Thomas Turner & Co., Limited, Watford	£4,641 0 0
J. & A. Brown, Braintree, Essex ..	4,498 0 0
C. Miskin, St. Albans	4,480 0 0
Wm. Bell & Sons, Saffron Walden..	4,460 0 0
Elwood & Son, Sandy, Beds.	4,390 0 0
S. Grist, Aylesbury	4,386 0 0
Chas. Ansell, 14, Edward-street, Lambeth, S.E.	4,300 0 0
A. Bunting, Fenstanton, St. Ives ..	4,108 0 0
J. Glasscock & Son, Bishop's Stortford	4,030 0 0
F. Dupont, Colchester (accepted)..	3,975 0 0

BLOEMFONTEIN (Orange Free State, South Africa).—For the erection of a new Raadzaal (House of Deputies) in the City of Bloemfontein, for the Orange Free State Government. Mr. Lennox Canning, A.R.I.B.A., and Mr. Fred. G. Goad, C.E., joint architects, Bloemfontein and Johannesburg. Quantities by the architects and Mr. W. Leck :—

	Brick, with stone dressings.	Brick, with cement dressings.
T. Rowe, Johannesburg	£49,187 5 0	£45,379 10 0
A. L. Lawley, Johannesburg	33,071 10 0	30,978 10 0
Wocke, Bloemfontein	—	29,000 0 0
Royce & Co., Johannesburg	28,300 0 0	26,300 0 0
G. R. Robertson, Johannesburg* ..	27,183 17 6	23,432 0 0

* Accepted.

BOURNEMOUTH.—For erecting the new Richmondhill Congregational Church, Bournemouth. Messrs. Lawson & Donkin, architects and surveyors, Bournemouth. Quantities supplied :—

Stephens, Bastow, & Co, Bristol..	£12,999 0 0
W. Hoare, Bournemouth	12,720 11 4
Jenkins & Sons, Bournemouth....	12,500 0 0
J. Shillitoe & Sons, Bury St. Edmunds	12,200 0 0
F. Hoare & Sons, Bournemouth ..	12,178 0 0
J. T. Chappell, London	11,890 0 0
George & Harding, Bournemouth	11,845 0 0
F. Merrick & Son, Glastonbury ..	11,773 7 0
J. S. Kimberley, Banbury	11,322 0 0
T. H. Kingerlee, Oxford*	10,649 0 0

* Accepted.

BOURNEMOUTH.—For supplying two sets of three-throw pumps for the Bournemouth Commissioners. Mr. T. W. Lacey, Engineer and Surveyor :—

S. Owens & Co., London	£1,050 0 0
Bilbie, Hobson, & Co., London....	818 0 0
Ed. Humphries, Limited, Pershore	608 0 0
Wood & Co., Bournemouth	548 0 0
Warner & Sons, Cripplegate, E.C..	546 0 0
Crossley Bros., Manchester	512 15 3
Constructional Iron Works Company, Bow, E.	500 0 0
G. Waller & Co., London	498 0 0
Day & Co., Bath (accepted)	395 0 0

LONDON.—For alterations at the "Nightingale" Hotel, Southgate-road, Wood Green. Mr. R. A. Lewcock, architect, 88, Bishopsgate-street Within :—

F. Voller (accepted)	£898 0 0

HEMEL HEMPSTED.—For the erection of a new Congregational Church and Sunday-school class-rooms. Mr. W. A. Fisher, architect, Hemel Hempsted. Quantities supplied :—

	Church.	Class-rooms.	Total.
Wilmott	£2,650 ..	£310 ..	£2,960
Dunham	2,600 ..	345 ..	2,945
Honour	2,570 ..	325 ..	2,895
Waterman	2,557 ..	314 ..	2,871
Sear	2,500 ..	310 ..	2,810
Horn	2,480 ..	300 ..	2,780
Miskin	2,450 ..	290 ..	2,740
Judge	2,350 ..	370 ..	2,720
Martin, Wells, & Co.	2,389 ..	295 ..	2,684
Payne	2,302 ..	266 ..	2,568

[Architect's estimates £2,403, £270, £2,670]

Revised Tenders for Church, less allowance for Old Materials, Boundary Walling, &c.

Judge	£1,903 0 0
Sear	1,980 0 0
Martin & Co.	1,989 0 0
Miskin	1,960 0 0
Payne	1,932 0 0
Horn (accepted)	1,843 0 0

[Architect's estimate, £1,970.]

HETTON-LE-HOLE (Durham).—For two residences for Messrs. C. & J. Robinson. Messrs. Plummer & Burrell, architects, Newcastle :—

G. Bryce, Newcastle	£1,600 10 0
Geo. Gradon & Son, Durham	1,590 0 0
F. Caldcleugh, Durham	1,476 0 0
John Shepherd, Durham	1,467 0 0
J. Willis, Hetton	1,453 0 0
W. Girven, Easington	1,424 0 0
W. & W. Scott, Newcastle	1,389 0 0
J. Tremble, Hetton (accepted)	1,328 12 0
J. Healop, Pittington	1,258 12 5

LEIGHTON BUZZARD.—For the erection of a detached private residence at Leighton Buzzard, Beds, for Mr. T. H. Bishop. Mr. St. Pierre Harris, architect, 1, Basinghall-street, E.C. Quantities by Messrs. C. Stanger & Son, 21, Finsbury-pavement :—

Holt & Son, Croydon	£1,869 0 0
H. Edwards, Leighton	1,695 0 0
Tutt Bros., Leighton	1,690 0 0
Cook & Sons, Leighton	1,680 0 0
Webster & Cannon, Aylesbury	1,595 0 0
G. Garcia, Leighton	1,580 0 0

LONDON.—For erecting residence in Beaumont-street, W. Mr. T. Durrans, architect, 41, Upper Baker-street, N.W. :—

Stevenson	£3,600 0 0
White	3,590 0 0
Ward, Clarke, & Co.	3,475 0 0
Bovis	3,385 0 0
Aitchison	3,300 0 0
Higgs	2,457 0 0

[Architect's estimate, £2,500.]

LONDON.—For pulling down and rebuilding No. 424, Holloway-road, for Mr. Matthews. Mr. Truefitt, architect, 5, Bloomsbury-square :—

Drew	£1,776 0 0
Ward & Lamble	1,677 0 0
Gould & Brand	1,630 0 0
Hunt	1,419 0 0

LONDON.—For new roof and sundry other works at the School of Medicine for Women, No. 7, Hunter-street, and 30, Handel-street, Brunswick-square :—

McCormick & Sons, 34, Canonbury-road, N. (accepted)	£450 0 0

LONDON.—For pulling down and rebuilding No. 454, Holloway-road, for Mrs. Bearley. Mr. Truefitt, architect, 5, Bloomsbury-square :—

Stewart	£1,840 0 0
Goodman	1,596 0 0
Tennant	1,466 0 0
Ward & Lamble	1,433 0 0
Hunt	1,397 0 0
Macfarlane Bros.	1,198 0 0

LONDON.—For pulling down and rebuilding No. 436, Holloway-road, for Mr. Matthews. Mr. Brown, architect, 29, Parliament-street :—

Drew	£1,690 0 0
Ward & Lamble	1,597 0 0
Gould & Brand	1,513 0 0
Hunt	1,408 0 0

LONDON.—For alterations and additions after fire to Nos. 8, 10, and 12, Mason-street, Westminster-bridge-road, for the Alliance Dairy Company, Limited. Mr. James M. Cable, architect :—

Hill Bros.	£485 0 0
Peacock	392 4 0
T. Hooper	373 0 0
Tasker	350 0 0

WOOLWICH.—For alterations at the "King's Arms" Hotel, Woolwich Common. Mr. R. A. Lewcock, architect, 88, Bishopsgate-street Within, E.C. :—

J. Beale (accepted)	£649 0 0

LONDON.—For alterations at the "Unicorn" tavern, Norton Folgate, E.C. Mr. R. A. Lewcock, architect, 88, Bishopsgate-street Within :—

Harris & Wardrop (accepted)	£694 0 0

LONDON.—For alterations at the "Duke of Ormond's Head," Princes-street, Westminster. Mr. R. A. Lewcock, architect, 88, Bishopsgate-street Within :—

Woolley (accepted)	£400 0 0

LONDON.—For the conversion of No. 15, Portobello-road, Notting-hill, into stables. Messrs. Glasier & Sons, Surveyors :—

S. Dowsing & Sons	£339 0 0
Clarke & Mannooch	330 0 0
T. G. Davis (accepted)	300 0 0

LONDON.—For erecting dwelling-houses, Ploughlane, Kensal-green. Mr. H. W. Budd, architect :—

Lamble (accepted)	£1,287 0 0

LONDON.—For new drains and sanitary works at "Stanbridge," No. 41, Nicoll-road, Willesden, N.W., for Mr. Edwd. Tuckey :—

McCormick & Sons (accepted)	£108 0 0

LONDON.—For painting and decorating works at No. 10, Savile-row, W. :—

McCormick & Sons (accepted)	£200 0 0

LONDON.—For making road, putting in the sewer, and laying the mains for water supply to Eyot-gardens, Hammersmith. Messrs. Robinson & Fisher, surveyors, 21, Old Bond-street :—

Brown & Co. (accepted)	£256 0 0

ORPINGTON (Kent).—To alterations and additions to private residence at Orpington, Kent. Mr. St. Pierre Harris, architect, 1, Basinghall-street, E.C., and Orpington, Kent :—

Somerford & Son	£226 0 0
Holt & G. Glassap	206 0 0

RICHMOND (Surrey).—For the erection of seven shops. Mr. Robert Evans, architect :—

Munday Lane & Co. (accepted)	£7,900 0 0

TAYPORT (near Dundee).—For the sewage and sea outfall works at Tayport, near Dundee. Mr. W. H. Radford, engineer, Nottingham :—

Wm. G. Flett, Glasgow	£4,168 6 2
Brown & Young, Glasgow	3,995 0 0
R. C. Brebner, Edinburgh	3,428 17 0
Holmes Bros., Nottingham	2,990 0 0
Mitchell & Bond, Dundee	2,935 10 0
G. Mackay & Son, Broughty Ferry, near Dundee (accepted)	2,898 17 4

WEST DRAYTON (Middlesex).—For extension to buildings for the Electrical Engineering Corporation, Limited :—

C. F. Kearley, Uxbridge (accepted)	£1,717 0 0

WALTHAMSTOW.—For road and sewers on the "Woodlands" Estate, Walthamstow. Messrs. E. E. Croucher & Co., surveyors, 76, Chancery-lane :—

G. Bell, less allowance for house	£662 0 0
T. Adams ,, ,,	636 0 0
W. Nicholls ,, ,,	543 0 0
J. Jackson ,, ,,	483 0 0

WEST HAM.—For works in connexion with the West Ham Main Drainage Extension (contract No. 7), for the Corporation of West Ham. Mr. Lewis Angell, Borough Engineer :—

Dickinson, Loughborough Junction	£8,291 0 0
Dickson, St. Albans	7,151 0 0
Adams, Kingsland	6,730 12 3
Jackson, Plaistow	5,900 0 0
Cooke & Co., Battersea	5,896 10 0
Bentley, Leicester	5,704 9 0
Neave, South Woodford (accepted)	5,663 0 0

WIMBLEDON.—For the erection of new fire-engine station at Wimbledon :—

J. F. Collinson, Teddington*	£690 0 0

* Accepted.

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